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IMPROVED WATER WHEELS WITH ADJUSTABLE BUCKETS.

Pressure wheels which are actuated by the water passing through the buckets are coming into very general use, being cheaper to construct than the old overshot and breast wheels, and better adapted for varying heads, especially in localities where back-water is troublesome, as they will give out the full effect of the head when submerged, and when overshot and breast-wheels are completely prevented from running. In order, however, to obtain the full effects of the water-power, it is desirable that the issues of the buckets should be capable of adjustment for varying circumstances. This is the object of the improvement illustrated by the accompanying engravings. They represent a horizontal center discharge wheel, with adjustable buckets, for contracting and expanding the issues, according to the circumstances of the case. Fig. 1 is a vertical section of the wheel; Fig. 2 a horizontal section; Fig. 3 a vertical section of a portion of the wheel; and Fig. 4 a plan view of a portion of it. Similar letters refer to like parts. A A represent the upper and lower rims of the wheel, and are connected by arms to the vertical shaft, B. The scroll, C, is made for conducting the water to the buckets, as shown by the arrows. D are the buckets placed between the rims. They are of a curved form and made with double plates, forming shells. Each bucket has a bearing, *a*, at top and bottom; *b* is a tube for each bucket. These are a little longer than the hight of the buckets, and form bearings for the two rims, A A, which are secured in position by the bolts, *c*, that pass through the tubes. These latter permit of a free turning of the buckets, as the rims are not allowed to bear upon them. These tubes, therefore, serve as pivots on which the buckets are turned when adjusted. A series of slots, *d*, Fig. 4, are made in the upper rim, A. These are so curved as to form portions of a circle concentric with the rim. A ring, E, is also placed on the upper rim, and it has pins, *e*, attached to its under side. These are inserted in the slots, *d*, and pass between the plates of the buckets—one pin for each bucket. The screws, *f*, pass through the ring, E, and the curved slots, and into the upper rim.

It will be observed from this description that, by moving the ring, E, concentrically, the buckets, D, may be adjusted to expand and contract the issues, as shown in two positions by Figs. 2 and 4. By turning the ring, E, the pins, *e*, actuate the buckets to adjust the issues properly, when they are then fastened by the screws, *f*. This operation can be readily executed, so that the dimensions of the issues may be made to correspond with the head of water and with the power required from the wheel, in order that the maximum power of the water may be always obtained. And if the maximum power of the head is not required, no more water will be used th by the wheel.

The experiments with this class of wheels which recently took place at Philadelphia, and the results of which were published on page 22 of the present volume, as taken from the report of the chief engineer, have justly attracted a great deal of attention. None of the wheels tested on these occasions, we believe, were furnished with adjustable buckets; they were, comparatively speaking, like steam engines working full stroke, while the one here illustrated is like a steam engine with an adjustable cut-off. This fact, therfore, is worthy of much consideration, as a great deal of effort has lately been made among millwrights and others to invent and construct a suitable wheel with variable buckets, such as we have here described.

A patent was granted for this improvement on Dec. 6, 1859, to Mr. E. G. Cushing, of Dryden, N. Y., to whom those desiring further information should address.

Fig. 1

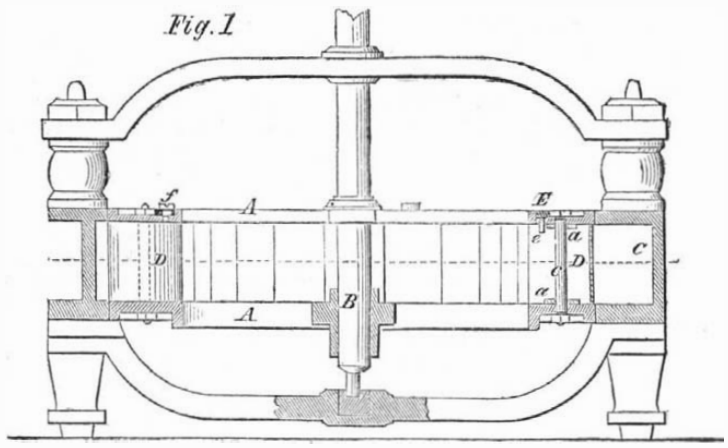


Fig. 2

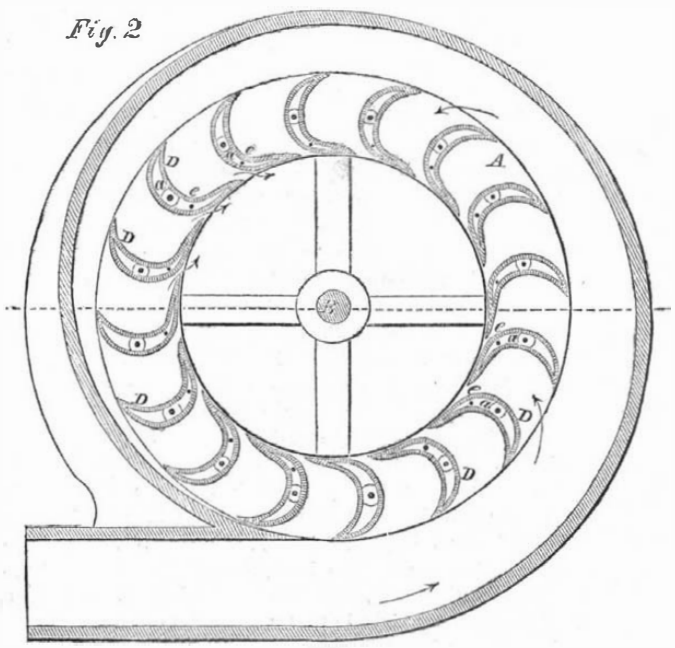


Fig. 3

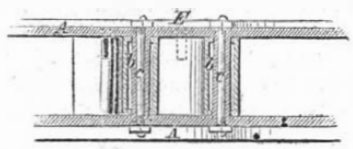
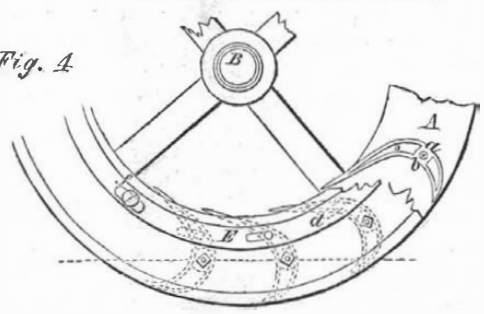


Fig. 4



CUSHING'S IMPROVED WATER WHEEL.

FRICTION—IRON AND WOODEN AXLES.

A correspondent—G. B. Weaver—of the Boston *Cultivator* states that there is a great difference of opinion among farmers regarding the merits of iron and wooden axle-trees in wagons for "drawing easy." Some believe that a load can be drawn easier with a wagon having wooden axles than upon one having iron axles, although the latter are not so large.

If the experiments of Morin on friction were correctly conducted, then there ought to be no difference in draught, as it regards friction, on account of the difference in size of the axles; because the friction is in proportion to the load upon it, not its size. Upon this point there is a difference of opinion among millwrights and others, and it is very important that it should be well ventilated, as it lies at the very root of practical mechanics. Thus, it has generally been held that the smaller the shaft or axle the less the friction; hence it is customary to make all the spindles, shafting and axles of machines as small as possible, to lessen the amount of friction. If this principle in mechanics is correct, then iron must be the best material for axles. Another question also arises here, viz.: may it not be quite true that the friction on an axle or shaft is in proportion to its load and size combined? A very intelligent correspondent, writing to us from Newton, Upper Falls, Mass., contends that this is the case, and gives a peculiar reason for his views. He asserts that the friction is in proportion to the load directly; but the load upon a large shaft is greater than upon a small shaft, because there is a greater atmospheric pressure upon its more extended surface. Of those which are horizontal and work in air-tight stuffed boxes.

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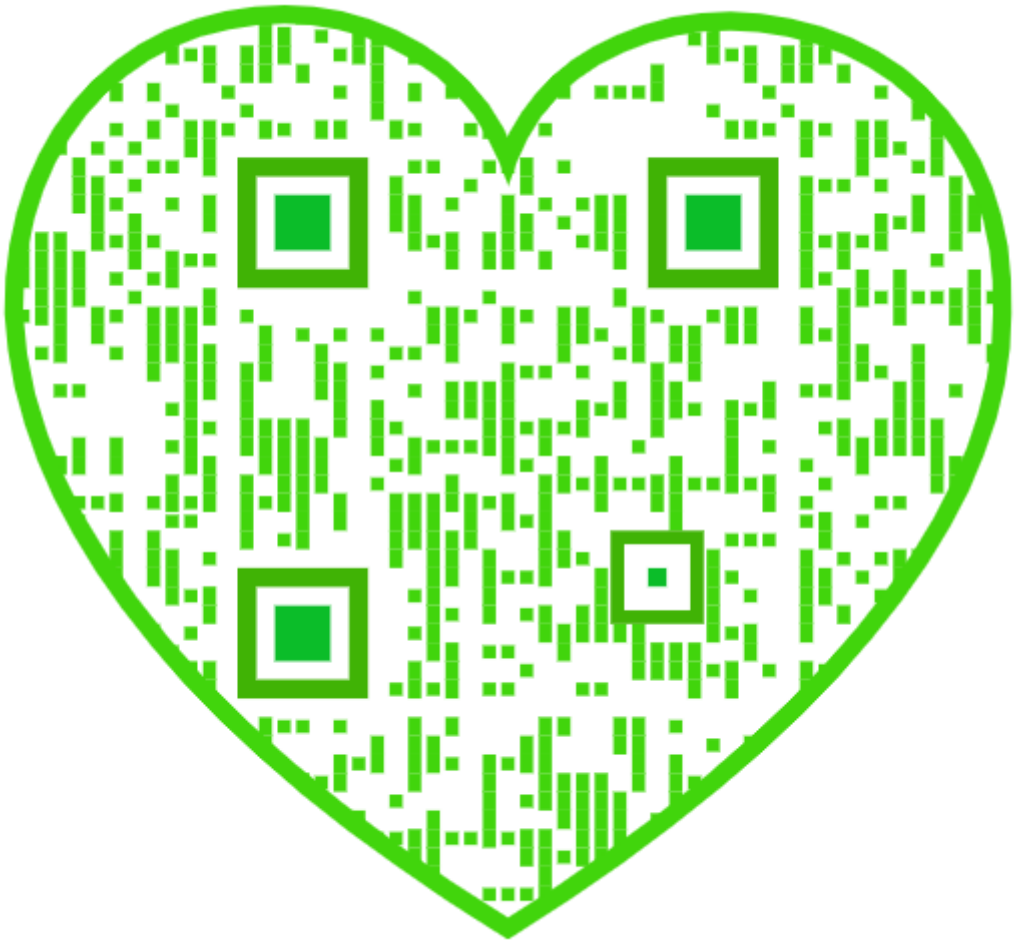

OUR SPECIAL CORRESPONDENCE.

The most Peculiar Feature of the Texan Climate—Great Value of Railroads—Immense Distances—Extensive Trade—Windmills Wanted—Live-oak—The Inhabitants Remarkably Pious—A Curious Coincidence—The "Scientific American" Everywhere.

KELLUM SPRINGS, Texas, June 15, 1860.

MESSRS. EDITORS:—In a general view of Texas the most striking feature is the extreme dryness of the climate, and this is perhaps the most important peculiarity in its immediate bearing on the prospects of mechanics here. A season in which there is sufficient rain to produce good corn and other crops throughout the State is an exception to the general rule. This will confine the cultivation principally to cotton, which has a long and deep piercing root, enabling it to bear drouth remarkably well, and to the winter grains, which make most of their growth in the Spring and Fall, when the rains are abundant. As only a portion of the State is a good wheat country, the tendency of all things is to direct the agricultural force more and more exclusively to the cultivation of cotton. This great breadth of new land is an inviting outlet to the emigration from the old cotton States, and is being so rapidly filled by this kind of immigration that lands are rising here faster perhaps than anywhere else in the country. Now, this almost exclusive devotion of the agriculture to the cultivation of cotton has a controlling influence over the industrial operations of the country in many respects. In the first place, it makes the exchange of property large in proportion to the aggregate product. On inquiring where the flour was ground which I was eating for supper in Madison county, I was told that it was bought in New Orleans. "You have to haul your flour a long distance," I remarked.

"Oh no," was the sober reply, "only 115 miles."

This large amount of exchanges is a good thing for the traders. One man in Houston, we were assured, sells $700,000 worth of goods per annum. As all the cotton must be transported to the sea-shore, and the merchandize required in exchange for it, from the sea-shore back all over the State, the amount of labor devoted to transportation is very large, and an immense trade is carried on in wagons, many of which are made in Philadelphia. There is probably no State which will be so much benefited by railroads as Texas. These are being rapidly extended, a portion of the ten millions received from the general government being devoted to this purpose.

As it is very desirable for the people to raise sufficient corn, potatoes, &c., for their own use, they are considering the plan of irrigating fields for this purpose. The almost constant breeze affords ample power, and some windmills have been ordered from the North, and will soon be in operation, pumping water over this thirsty ground. The thing wanted is a cheap and simple apparatus, not to cost over $25, with pump included, and requiring no mechanical skill to erect it. If any of your readers have such a mill, let him advertize it at once in your paper, and if there is none, let one be invented forthwith. I venture the prophecy that within ten years, thousands of windmills will be erected in Texas for the purpose of irrigation.

Gov. Houston has stated publicly that Texas contains more live oak than all the balance of the world. But this, like many other of the resources of this great State, is wholly undeveloped. But the vigorous population which is pouring in, combined with the railroads which are spreading their branches over the State, will soon unfold its latent mines of wealth.

It may surprise you to learn that the inhabitants of Texas are the most religious of any in the Union. The Methodists are the most numerous sect, and it has seemed to me as if all the people of the State are members of that ubiquitous church. Of course, there are a few rowdies who shoot one another occasionally, but these constitute a very small fraction indeed of the inhabitants, who, I am inclined to think, taken as a whole, are as religious and as moral also as those of any part of the world.

As I was sitting on the piazza, last evening, conversing with an intelligent school-teacher, he observed the three bright planets which are now seen nightly slowly descending the western sky, and remarked, "I saw in the *Saturday Evening Post* a very simple direction for telling the time of night by the stars."

"Well," said I, "that is a curious coincidence. I wrote that article myself for the SCIENTIFIC AMERICAN. Was it not credited?"

"No," he said, "I believe it was by a correspondent."

But by a more complete account, I found that it was the *very* article which I wrote for your paper. They have the SCIENTIFIC AMERICAN here, and, indeed, I find it wherever I go. B.

[The attention of our correspondent and that of our Texan readers is directed to two inventions described in the present number of the SCIENTIFIC AMERICAN, namely, the "American Windmill" and the "American Pump," which seem adapted to the requirements of Texan agriculturists.—EDS.

THE STRENGTH OF CAST-IRON COLUMNS.

MESSRS. EDITORS:—My attention has been recently called to a communication made to the American Academy of Arts and Sciences, within a few months, by Professor Treadwell, of Cambridge, on the subject of cast-iron columns. This communication, which was published at length in the newspapers, contains errors too serious to be passed by in silence, especially when emanating, uncontradicted, from so distinguished a body as the above-named institution. The terrible catastrophe at Lawrence, where the yielding of a single cast-iron column sent a thrill of horror through our nation, shows how important it is that this subject should be correctly presented to the public. Not having seen any correction of the errors in the communication alluded to above, I take advantage of your extensive circulation to point them out, and present the matter in its true light.

After giving a history of the theoretical and experimental investigations which have been made for the determination of formulæ, indicating the strength of any column, the above-named author concludes, by attaching the greatest importance to the formulæ deduced by Hodgkinson from extensive experiments. Thus far we have no objections to offer; the error creeps in with the attempt to use these formulæ. Hodgkinson, in his experiments, recognized three kinds of fracture which are liable to occur in case of iron columns.

When a column is very short, its length not exceeding two diameters, fracture occurs by the *crushing* of the particles. In this case the weight necessary to produce fracture does not vary with the length of the column, but depends solely on the area of the cross section of the column, and the strength of the iron per square inch to resist compression. Let w represent the weight in tuns (of 2240 pounds each) necessary to fracture such a column; D, the external diameter of the column in inches; and d its internal diameter in inches. For cast iron we may take, as an average value, the weight necessary to crush a square inch at sixty tuns. Using these values we shall have for round columns, $w = 60 \times 3.1416 \times (D^2 - d^2) \div 4$.

Second, When a column is very long, its length exceeding thirty diameters, fracture occurs by *bending*. If W represent the weight in tuns necessary to fracture such a column; D and d its external and internal diameters in inches, and l its length in *feet;* we shall have for round columns, according to Hodgkinson's formulæ, $W = 44{\cdot}16 \times [(D^{3.55} - d^{3.55}) \div 71.7 l]$ The crushing weight varies directly as the difference of 3.55th power of the diameters and inversely as the 1·7th power of the length.

Third, When the length of a column exceeds two diameters, but does not exceed thirty diameters (limits within which almost all columns do lie and all ought to lie) its fracture occurs by *a combination of crushing and bending*. B representing the weight in tuns necessary to fracture such a column, we shall have for round columns, according to Hodgkinson's formula, $B = W w \div (W + \frac{3}{4} w)$, the values of w and W, being determined in the manner already indicated. The errors in the communication of Professor Treadwell have arisen from the use of the formula $w = 44.16 \times [(D^{3.55} - d^{3.55}) \div 71.7 l]$; as if it were universal in its application, and not limited to those columns whose lengths *exceed* thirty diameters. The effect of this error would be to give to all columns *under* thirty diameters in length a value for their strength greater than they really possess, and in case of very short columns much greater. Take, for illustration, a column 6 feet long, having an external diameter of 12 inches, and an internal diameter of 10 inches. According to the formula recommended by Professor Treadwell, the breaking weight of such a column would be 6,782 tuns (of 2,240 pounds each), which corresponds to a weight of nearly 200 tuns on each square inch of the iron! One-third of such a strain would crush a column two feet high. But the formula which I have here indicated gives, for the actual breaking weight of such a column, 1618 tuns, or less than a quarter of that given by Professor Treadwell; and this shows the enormous errors that would arise from the use of the formula given by him in the case of ordinary columns.

The exact weight that would break the column, if it broke by *crushing* = 2,073 tuns; if it broke by *bending* = 6,782 tuns; but if it broke by *a combination of crushing and bending*, the actual breaking weight = 1618 tuns. While these values are determined according to the best formulæ now known, it must still be admitted that the whole subject of the strength of iron columns demands much additional investigation. J. W. S.

Rochester, July 2, 1860.

P. S.—To show the absurdities into which compilers of "handbooks" are led by attempting to apply formulæ of the use of which they are totally ignorant, I will mention that Haslett's "Mechanics and Engineers' Book of Reference" states "the ultimate breaking weight of an iron column, one foot high and 24 inches in diameter, is 4,122,530 tuns." This is over 9,000 tuns per square inch!—150 times the breaking weight of iron! Public safety demands that such egregious errors should be pointed out.

BALLOONS USEFULLY APPLIED.

A recent number of the Newcastle (England) *Chronicle* contains some interesting observations on meteorological observations in balloons. It appears that a committee of the Kew Observatory recently resolved to institute a series of balloon ascents with a view of investigating "such meteorological and physical phenomena as require the presence of an observer at a great hight in the atmosphere." The object to which special attention was devoted was the determination of the temperature and hygrometric condition of the air at different elevations above the earth's surface, Besides this, the observers were furnished with means of procuring specimens of the air at different hights for the purpose of analysis, and of examining, if opportunity offered, whether the light reflected from the upper surface of the clouds was polarized. The instruments required for the investigation were a mountain barometer, dry and wet thermometers, an aspirator (or elastic apparatus to draw the air of the different strata past the bulbs of the thermometers, &c.,) Regnault's condensing hygrometer, a polariscope and glass tubes (furnished with stop-cocks) from which the air had been exhausted. Two observers took part in the work, in the first ascents, in addition to the aeronaut who managed the balloon. The car was an oblong basket of wicker-work, about 6 feet long, 3 feet wide, and 2½ feet deep. The ascents were made with Mr. C. Green's balloon, well-known as the "Royal Nassau," with which that gentleman had made upward of 500 ascents with perfect safety. The first ascent took place on the 17th of August, 1859, under considerable difficulties. No remarkable event occurred during the journey, which extended over 57 miles, the balloon having traveled at the rate of 38 miles an hour. The second ascent took place on the 26th of August. The third ascent took place on the 21st of October, when, in consequence of their being only two persons in the car, a great altitude was attained. The polariscope, used at an altitude of 4,000 feet above the clouds, indicated that the reflected light from the clouds next the sun showed no trace of polarization, the light of the sky being strongly polarized. The fourth ascent took place on the 10th of November. On this occasion an elevation of 22,930 feet above the level of the sea was attained; the balloon traveling at the rate of 50 miles an hour. The effect of the diminished pressure of the air was felt somewhat inconveniently, and much breathlessness and fatigue were experienced after slight muscular exertion. The descent was rapid, in consequence of the discovery that the direction of the balloon was seaward. On the days of the various ascents many observers in different parts of the country made corresponding meteorological observations at hourly intervals, and these were arranged

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in a tabular form by Colonel Sykes, the secretary to the association. From elaborate tables prepared by the aeronaut, Mr. Welsh, and completed by Colonel Sykes, it appears that there is a steady decrease of temperature in passing through the lower stratum of air up to about 4,000 feet; above the decrease is arrested, and a uniform temperature appears to prevail in the zone of atmosphere above for a distance of 2,000 feet, above which the temperature again falls in a regular ratio to altitude. This increase of cold is coincident with an abrupt diminution of vapor. A decided rise of temperature was always noticed on entering a cloud, and for a space of 600 feet above it, after which the decrease and elevation proceeded as before. The regular progression of decrease of temperature with elevation can, therefore, be no longer maintained. The interruption in the decrease of temperature was invariably accompanied by a large and abrupt fall in the temperature of the dew point, or by actual condensation of the vapor. From the analysis of the samples of air, it appears that the composition of the atmosphere, as regards the proportion of oxygen and nitrogen, scarcely varies more as we ascend through the first half of that atmosphere (for at an altitude of about 3½ miles one half of the atmosphere lies beneath the aeronaut) then it is found to vary at different spots upon the surface. There is indeed no sensible difference in the composition of the air at the surface and at the greatest hight accessible to man.

SAILING OF THE ARCTIC EXPEDITION.

On Saturday, the 7th inst., the Arctic expedition of Dr. Hayes sailed from the port of Boston. The event excited a great deal of interest, and drew together quite a large crowd on the wharf, while the decks of the vessel were crowded with a large number of distinguished individuals, among whom was Governor N. P. Banks, who has evinced a readiness at all times to advance the progress of the expedition. The vessel and all its outfit were formally presented to Dr. Hayes, and he was assured by the Boston committee of their entire confidence in his integrity, ability and honesty. Dr. Hayes, in accepting the gift of the vessel, and the honor and trust conferred upon him, made an eloquent speech, during which he was frequently interrupted by expressions of kindly sentiments on the part of gentlemen present; and the doctor took this occasion to introduce the officers and crew to those present, and complimented them on their courage in joining him in his journey.

The following is a list of the officers and crew:—Commander, Dr. Isaac J. Hayes; astronomer and second in command, August Sontag; sailing master, S. P. McCormick; mate, H. W. Dodge; captain's clerk, G. F. Knorr; assistant astronomer, Henry G. Radcliff; carpenter, Gibson Caruthers; cabin boy, Colen C. Starr; steward, Frank L. Harris; cook, John Williams; crew, Charles McCormick, William Miller, Harvey S. Heywood, Thos. F. Browne, John McDonald and Thomas Bowman. The expedition carries no surgeon other than the commander. There will be neither an artist nor a photographist on board, although the vessel has a splendid set of photographic instruments, which will undoubtedly be used by Mr. Sontag, who is a very good artist.

VOLCANOES OF THE NORTHWEST.

The following interesting article is from the Des Moines (Iowa) *Commonwealth*:—"Mount Baker and Mount St. Helens, in Washington territory, are active volcanoes; the former smokes considerably, and occasionally shows a red light at night. St. Helens smokes a very little, the smoke in the day-time resembling a thin column of white steam. There has been no eruption of St. Helens since 1842, at which time it covered the country with ashes to the Dalles, distant one hundred miles. Great streams of hardened lava are found in various places in Mount St. Helens and Mount Adams, and probably near the other sister volcanic peaks. Mount St. Helens and Mount Baker are the only active volcanoes on the American soil, unless Mount Shasta (which sometimes smokes a little, but not enough for the smoke to be seen from the foot of the mountain) be added to them. Mounts Hood, Rainer, Jefferson and Adams were undoubtedly volcanoes once, but they are now extinct. In a paper contributed by George Gibbs to the documents relating to the survey for a northern Pacific railroad, he says the Indians have a characteristic tale relating to Mounts Hood and St. Helens, that they were formerly man and wife, but they quarreled, and threw fire at each other, and that St. Helens was the victor, since when Mount Hood has been afraid, while Mount Helens, having a stout heart, still burns. There was still a further tradition among the Indians, when the writer was in Oregon, that Mount Hood and Mount St. Helens, were connected by a continuous ridge or chain, and that the Columbia river, which runs between them, had a subterranean passage at the point known as the 'Cascades.' The Columbia then had a smooth, even course, under an immense arch of the mountain, but that unfortunate matrimonial difficulty above referred to did not end in throwing fire; they also broke down the conjugal arch, which fell with a thundering crash into the river, and formed the 'Cascades.' The 'Cascades" are from one to two miles in length, and have a fall of about twenty feet per mile. Their appearance would indicate that there might be some truth in the tradition, and that it occurred at no very distant period —perhaps within the last century. The opinion is sustained by the geological formation above the 'Cascades,' where the river spreads out and becomes a lake, some twenty miles in length and several in breadth. The bottom of the lake in many places is covered with a heavy growth of timber standing upright, in the exact condition it grew, no doubt, and reaching to the top of the water, say from 20 to 30 feet. The tops of the trees have long since disappeared, making the surface of the lake, at low water, look like a clearing full of stumps. On examination, the wood was found to be quite sound below the water. An answer to the question, how long has the forest been submerged? might also fix the period when these volcanoes became extinct."

THE WORKING OF STEAM ENGINES.

Messrs. Editors:—Having recently noticed an article on the working of steam engines (in the Scientific American), I thought a word or two of my own experience might not be amiss; and as in the last 10 years' experience I have often gained many useful lessons from the columns of your valuable paper, my own may benefit some of the novices now in the field. In the first place, I advocate a cut-off valve (of which there are a great many now in use) and a high pressure of steam, so as to get the benefit of expansion. But the common trouble is that what is gained by the expansion is lost by the increased friction on the valve; so that what we now want is an *anti-friction valve*. You mention the fact that the piston rings are too cumbrous. I agree with you precisely; having run engines with rings large enough for machines of twice the capacity. Then the process for setting the packing is behind the age, as, with the old plan, it is impossible to have the bearing of the ring evenly divided. But I think this is on the point of being overcome by the use of a new spring, manufactured in this city, and called the "letter Z packing spring," which consists of a number of small springs bent the shape of a flat letter Z, and placed between the piston head and the ring; the head being made round, instead of the skeleton shape. The springs being placed close together make the bearing exactly even on the whole surface; and as fast as the cylinder wears, the springs take up the spaces, thereby doing away with the labor of setting-out packing until the rings become worn out or too small. In these days, when *engineers* are manufactured at an hour's notice, this is quite an object, as it removes the most intricate duty of the engineer—the setting of his packing. Another great fault of engines is the smallness of the exhaust pipe, which I agree with you should be a great deal larger than the induction valve. C. R.

Albany, N. Y., July 14, 1860.

A WONDERFUL CAVE.

Messrs. Editors:—According to promise, I herein give you another report concerning the cave at this place. Since my first *winter* visit, detailed in a previous letter (published on page 211, Vol. II., of the Scientific American), I have made frequent visits to the cave; but as there has been but little alteration, I have delayed a regular report until now. On June 23d, at about 10 A. M., a friend and I started on a *midsummer* trip. crossed the river in a boat and commenced the ascent of the bluff as usual; it being very steep and, upon the whole, like the river Jordan—"a hard road to travel." All difficulties, however, being surmounted, we arrived at the mouth of the cave, and sat down to rest awhile and cool ourselves; looking at the thermometer, we found it stood at 80°. Here we found several pieces of candle and one old candlestick left by other visitors. We then commenced the descent; and as we walked, crawled and slid along, it began to grow cold quite fast—it seemed like going out of a warm room into the cold atmosphere of a *winter* morning. We soon began to see the frost on the walls, sparkling in the light of our lamps like millions of diamonds. This one sight is worth as much as all the natural exhibitions of every-day life to every lover of the beautiful. As we came to our first stopping-place we began to find *ice*, from a mere film up to *six or eight inches thick*. This part of the cave is in the shape of a wedge with the small end up; it being about six feet wide at the base, the sides drawing together overhead about 20 feet high—the one side covered with ice (clear as crystal) and the other with sparkling frost. Now we hung the thermometer on the wall and waited the result; the mercury going down gradually to 30°, where it remained. We also had a little water in a cup, and after leaving it on the rock for about 10 minutes, it became skimmed over with ice. There is not near the usual amount of ice in the cave that there usually is at this season of the year; and no doubt it is owing to the dryness of the season. The present spring and summer, so far, has been very dry in Decorah; and I have noticed that the more rain we have, the more ice forms in and around the mouth of the cave. Two years ago, there was so much ice in the first 50 or 60 feet of the cave that we had to cut steps in it with a hatchet to get down with safety. A great quantity of rain fell during that season. J. W. H.

Decorah, Iowa, July 3, 1860.

"YELLOW JACK" BANISHED FROM THE CRESCENT CITY.

Messrs. Editors:—It is with much regret that I observe a paragraph at the close of the letter of your correspondent, "B," dated Columbus, Ky., May 27, 1860, and published on page 386, Vol. II., Scientific American, in which it is stated that "the yellow fever had already made its appearance in New Orleans." This, no doubt, was written inadvertently and without inquiry, and probably the writer of it has been better informed before this; but coming, as it will, before the eyes of over a hundred thousand readers, it is calculated to do our city much injury. I have a large interest in this city, and am sorry that your journal should be the means of giving currency to so great an error, for to this day—one month from the time that your correspondent received his information—we have not had a single case of yellow fever. S. E. M.

New Orleans, La., June 25, 1860.

Mysterious Music on the Gulf Shore.—The mystic music sometimes heard at the mouth of the Passagoula river, on a still night, is one of the wonders of our coast. It is not confined, however, to the Passagoula river, but has often been heard at other places. At the mouth of the Bayou Coq del Inde and other inlets opening into the Gulf along the coast of our own country, the curious listener, lying idle in his boat, with lifted oars, when every other sound is hushed, may sometimes hear its strains coming apparently from beneath the waters, like the soft notes of distant Eolian harps. We have always supposed that this phenomenon, whatever its origin might be, natural or supernatural, was peculiar to our own coast. It appears, however, from Sir Emerson Tenant's recent work on Ceylon, something very like it is known at Battialloa, in that island, and it is attributed to rather less poetical and mysterious origin—that it is a peculiar species of shell-fish. They are said to be heard at night, and most distinctly when the moon is nearest the full.—*Mobile Herald.*

Manganic Acid.—A paper has been communicated to the Paris Academy of Sciences by Dr. Phipson, in which the author shows that the metal manganese, by uniting with oxygen, forms only one acid—manganic acid—analogous to chromic acid; and that the so-called "permanganic acid" does not exist. The salt so extensively used now in chemical laboratories, and known as "permanganate of potash," is shown to be *bimanganate* of potash, corresponding to bi-chromate, or anhydrous bi-sulphate of potash. This is an important discovery in mineral chemistry.

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PHYSIOLOGY OF REPRODUCTION.

A late number of the *Westminster Review* contains the following interesting article on the above topic:—

The student of nature wonders the more and is astonished the less, the more conversant he becomes with her operations; but of all the perennial miracles she offers to his inspection, perhaps the most worthy of admiration is the development of a plant or an animal from its embryo. Examine the recently laid egg of some animal, such as a salamander or a newt. It is a minute spheroid in which the best microscope will reveal nothing but a structureless sac, inclosing a glairy fluid, holding granules in suspension. But strange possibilities lie dormant in that semi-fluid globule. Let a moderate supply of warmth reach its watery cradle, and the plastic matter undergoes changes so steady and purpose-like in their succession, that one can only compare them to those operated by a skillful modeler upon a formless lump of clay. As with an invisible trowel, the mass is divided and subdivided into smaller and smaller portions until it is reduced to an aggregation of granules not too large to build withal the finest fabrics of the nascent organism. And, then, it is as if a delicate finger traced out the line to be occupied by the spinal column, and molded the contour of the body; pinching up the head at one end, the tail at the other, and fashioning flank and limb into due salamandrine proportions, in so artistic a way that, after watching the process hour by hour, one is almost involuntarily possessed by the notion that some more subtle aid to vision than an achromatic glass would show the hidden artist, with his plan before him, striving with skillful manipulation to perfect his work.

As life advances, and the young amphibian ranges the waters, the terror of his insect contemporaries, not only are nutritious particles supplied by its prey, by the addition of which to its frame growth takes place, laid down, each in its proper spot, and in such due proportion to the rest, as to reproduce the form, the color and the size characteristic of the parental stock; but even the wonderful powers of reproducing lost parts possessed by these animals are controlled by the same governing tendency. Cut off the legs, the tail, the jaws—separately or all together—and, as Spallanzan showed long ago, there parts not only grow again, but the redintegrated limb is formed on the same type as those which were lost. The new jaw or leg is a newt's, and never by any accident more like that of a frog. What is true of the newt is true of every animal and plant; the acorn tends to build itself up again into a woodland giant such as that from whose twig it fell; the spore of the humblest lichen reproduces the green or brown incrustation which gave it birth; and the other end of the scale of life, the child that resembled neither the paternal nor the maternal side of the house would be regarded as a kind of monster. So that the one end to which in all living beings the formative impulse is tending—the one scheme which the Archæus of the old speculators strives to carry out—seems to be to mold the offspring into the likeness of the parent. It is the first great law of reproduction that the offspring tends to resemble its parent or parents more closely than anything else.

BREAD.

MESSRS. EDITORS:—I am glad one of your correspondents from Ohio has recently started the subject of bread; and if you find anything new or useful in the following lines, I would feel highly gratified if you should publish it for the benefit of your numerous readers.

The fermenting agents which we use in the making of bread have, or should have, a two-fold aim; the first is to lighten the bread by introducing a gas (always carbonic acid) in the dough and thus throw its particles asunder by mechanical action. This object is attained by all known fermenters. But the second aim is only reached by two fermenters—the sour dough (dough in a state of acetic fermentation and used by the Germans in the making of their rye bread) and the well-known yeast. These two bodies seem to act directly on the granules of starch and burst them. Bread made properly with these two agents ought to be more nourishing than bread fermented by other means; and experiments made on regiments of soldiers, convicts, &c., in Saxony, have shown its advantage to be about 35 per cent. Besides this, bread raised by yeast or sour dough has an agreeable flavor, and retains its moisture longer than bread raised by alkalies. Mineral alkalies (saleratus or bi-carbonate of soda) used in the fermentation of bread have, besides disadvantages in an economical point of view, a most hurtful and pernicious influence on the human system. Introduced into the system, they seem to take the place of lime and its phosphates in the blood; and I am often inclined to think that the use of saleratus and soda in our bread and cakes has more to do with the thin bones, rotten teeth and flabby, soapy looks of our children—large and small—than many would imagine. Justice and common sense should banish mineral alkalies to the soap manufactory; but bakers should be compelled to eat the alum and sulphate of copper which they use to make bread white and their customers sick.

L. K.

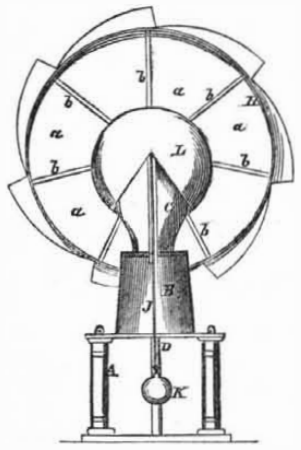
New York, July 12, 1860.

"THE AMERICAN WINDMILL."

The accompanying engravings illustrate an ingenious improvement in that class of wind-wheels which are commonly termed "portable," and which are more especially designed for driving light machinery; the object of the invention being to simplify and economize in the construction of such class of machines, and at the same time render the same more efficient than hitherto. The invention consists in the use of a deflecting cone placed over the gearing and so arranged, relatively with the wheel, that it may serve as a vane, and keep the former facing the wind; the cone serving the triple purpose of vane, cover or protector to the gearing, and deflector to cause the wind to act in the most efficient manner against the wheel.

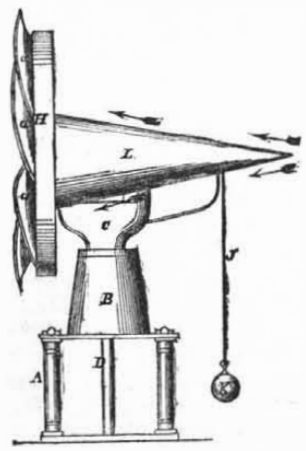
Fig. 1 represents a back elevation of the wind-wheel; Fig. 2 is a side elevation; and Fig. 3 is a side sectional view. A is a suitable framing on which a block, B, is

Fig. 1.



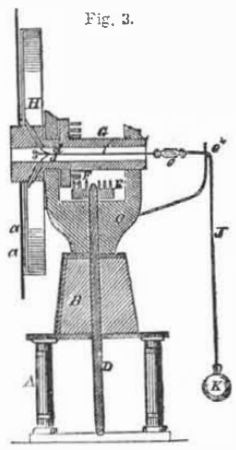
secured, and C is a cap placed on the block, B, and allowed to turn freely thereon, a vertical shaft, D, serving as a center for the cap; the shaft, D, passes through the cap, C, and block, B, and is allowed to turn freely in both. The upper end of the shaft, D, has a pinion, E, on it, and this pinion gears into a corresponding pinion, F, on a hollow shaft, G, which is fitted in proper bearings on cap, C. To one end of the hollow shaft, G, the wind-wheel, H, is attached. This wheel is formed of a series of sails or wings, *a*, attached to radial arms, *b*,

Fig. 2.



the inner ends of which are fitted in the shaft, G, and the outer ends fitted in a ring or bend, *c*. The arms, *b*, are allowed to turn freely in their bearings, and to each sail or wing a cord or rope, *d*, is attached at the lower end of the side opposite to that where the sail or wing is attached to its arm. The cords or ropes of the several sails or wings are all connected, within the hollow shaft, G, to a common cord or rope, I, which is connected by a swivel, *e*, to a rope, J, which passes through a guide, e*, and has a weight, K, attached to its lower end. The weight, K, is the exponent of the power of the wheel, for in consequence of being connected to the sails or wings as described, the latter are rendered self-regulating and are allowed to yield or give in accordance with the gravity of the weight. This self-regulating mechanism, however, is quite common and well known, and therefore does not require a minute description. L is a hollow cone which may be constructed of wood or metal. This cone has a section removed or cut out from one side, so that it may be fitted horizontally over the gearing, E F, and on the cap, C; the larger end of the cone being next to the wheel, as shown clearly in Fig. 2. The point of the cone projects some distance beyond the cap, C.

Fig. 3.



It will be seen that the cone serves as a covering or protector for the gearing, E F, and also serves to deflect the wind towards the outer part of the wheel, as indicated by the arrows in Fig. 2, thus rendering the wind-wheel more efficient than it otherwise would be. The cone also, for the above reason, serves further to render the turning of the wheel quicker with the changes of the wind.

The designer of the above-described improvement is E. F. M. Fletcher, of Georgia Plains, Vt., who patented the same on April 17, 1860; the patent is now jointly owned by the inventor and James M. Edney, who manufacture (at 432 East Tenth-street) and sell (at 147 Chambers-street) these wind-wheels at the following rates:—With sails of 12 feet diameter, $100; and 16 feet, $125. Wheels of these sizes will work all ordinary light machinery with great regularity and ease. Mr. Edney has a few State rights for sale and will be happy to furnish further information.

GAS-BURNERS.—A patent has just been taken out, in London, by Mr. Johnson, of Glasgow, for a gas-burner of the following simple construction, designed to prevent the flickering of the light. It consists of a tubular cap of thin cast iron or other metal, having a wide internal diameter, so as to fit by its open lower end upon or over an existing burner. The top of the burner is in the form of a solid convex end, through which a vertical slit is made to form the actual burner aperture for the gas, and produces a thin, broad, flat flame. When such a tubular cap is fitted upon or over an ordinary burner, the gas is received into the reservoir of the tubular cap, and it thence passes slowly off through the burner slit. The reservoir intervening between the common burner beneath and the burner slit in the top of the cap above, acts as a pressure-regulator, to prevent flickering and inordinate forcing of the gas, whilst the broad flat flame insures the production of a brilliant light.

WESTERN CROPS.—A correspondent states that wheat in Wabash Valley, Indiana, is light, but the grain is splendid. Corn is as fine as could be wished for, and an immense amount is planted. Oats are poor; hay, in some places, excellent and heavy. Vegetables are superior in quality and quantity. Fruits, on the average, are abundant. Wild fruits—blackberries, gooseberries, raspberries and plums—are plentiful. The present prospects for the edible comforts of mankind was never greater. The forest trees are covered with an extraordinary heavy foliage—leaves large and deep green. Animals are fat, and there is a cheering prospect for an abundance of heavy hogs and beef cattle.

THE sum paid out of the public treasury for cattle killed in Massachusetts, by order of the commissioners, on suspicion of having the *pleuro-pneumonia*, or for having been exposed to it, is between $22,000 and $23,000. That branch of the expenditure on this subject is probably now closed.

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WHAT BECOMES OF THE GOLD.

MESSRS. EDITORS:—I am much pleased with the SCIENTIFIC AMERICAN, and the great strides that are daily making in labor-saving machines; but whilst the mechanical genius has given us about all that we want for the development of the vast riches of the Pacific coast, science seems to be almost at a dead stand. Since the discovery of gold in California, it has been known that the quartz in the gold region contains more or less gold and other metals in *paying* quantities with the machinery already known for the reduction of the ores, if the metals could be separated and collected. We have had new projects from time to time introduced, both for the reduction and separating; but (as far as I have been able to observe) with no better success than the old stamp and Chilian *arastra*. It is true some new plans have been introduced that save more gold than formerly, but I think it most likely that they have been tried on better veins or that there are less of other metals that chemists tell us are in the way of a perfect amalgamation. I am satisfied that there is not a mill in this State that saves over one-fourth of the gold that passes through its machinery; for the "tailings" from any of them, when submitted to a fair assay, show from one to five hundred per cent over what they collect. When we see assays made of quartz that will yield fifty, one hundred, and even two or three hundred dollars a tun, and then see men erect machinery at a cost of five, ten, or fifteen thousand dollars, and that those men, on going to work, cannot save gold enough to pay expenses of less than seven, eight, or ten dollars a tun, we come necessarily to the conclusion that we have been deceived in the rock or that the man that made the assay for us did not understand his business. I am satisfied, however, that the secret will yet be unveiled to man, of a cheap and sure process of separating and collecting the different metals by machinery. It is for this purpose that I wish to call the attention of men of scientific attainments, through your columns, to the study of some mode by which this very desirable end may be attained. I do not think that there ever was or ever will be again so wide a field for the success of any one that may be the fortunate discoverer of any process that will collect the gold. I think there is machinery enough now at work to produce as much gold in a single year as has been produced in the last ten years, if all the gold that goes through the machinery could be obtained. I would suggest that any one who has the time and means should come to this State or send and get a quantity of the tailings from different mills to experiment on; they can be had at a very little cost. S. S. T.

Sonora, Cal., May 24, 1860.

[Whenever gold occurs with pyrites of iron or copper, the ordinary machinery and the amalgamating process are very inefficient. In such a case the gold is combined with sulphur, and until the sulphur is removed the mercury will no more dissolve it than it will quartz. It is a well-known fact in North Carolina that tailings exposed to the air for five or ten years may be worked as easily and with as much profit as the original ore. In such a case the sulphur is removed by oxydation from contact of the air. Chemists, in making an assay, in the first place take great pains to get rid of the sulphur by complete roasting or treatment with nitric acid or nitrate of potash or soda. Some cheap and handy chemical process is needed for the treatment of the pyritous ores; and as the demand for such a process is urgent, our enterprising inventors will soon find it.—EDS.

CRAYONS FOR MARKING LINEN.—M. Raymont, in *Le Génie Industriel*, gives the following process for making indelible crayons:—"Make a thorough mixture of 8 parts of alumina with two parts of oxyd of manganese. These ingredients must be dry, and the mixture be made impalpably fine. To this mixture add a solution of 3 parts of nitrate of silver in 5 parts of water. When the mass is thoroughly worked up it has the consistency of putty or dough, and is ready to be pressed into form by a suitable mold. The alumina is prepared by precipitation from alum by ammonia. Pipe clay or kaolin will answer nearly as well."

PENNSYLVANIA IRON.—The production of anthracite iron made in Pennsylvania in 1859, amounted to 286,332 tuns; of charcoal iron, 30,500 tuns. The average price for the anthracite was $22 per tun.

THOMSONS' IMPROVED FINGER-NAIL BRUSH.

The common finger-nail brushes are similar in form to the plain brushes used for a hundred purposes, only they are of smaller size, being narrow and having a handle attached. The accompanying figures represent an improved brush for such purposes, which from its form is very effectual in cleaning the finger-nails, as the following description will explain. Fig. 1 is a representation of the brush being used as applied, and Fig. 2 is a vertical section of it. A is a cup of metal or gutta percha of suitable thickness. The bristles, L, forming the brush are secured around the interior ring, R, as shown. In the center, there is a projecting stem, B, which is fixed to a central socket, C, with a screw, D, or otherwise. E, is a metal button on which to rest and press the finger. This cup-brush is applied to clean the nails

Fig. 1.

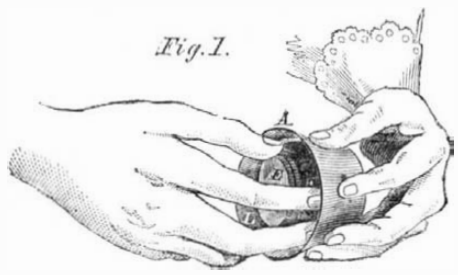
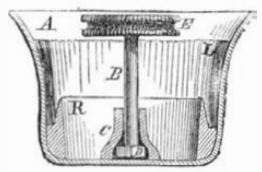


Fig. 2.



as shown in Fig. 1. It is held by the one hand, while the nails of the other are pressed against the top of the bristles, and the cup is then turned which rotary action cleans the nails in a superior manner. The small metal button, E, permits the cushions at the finger ends to be held back from the nails, and the outside cup, A, keeps the bristles in place and serves as a guide for the fingers while turning the brush round. The nails of both hands are cleaned in the manner represented and described, in a very rapid and perfect manner as will be understood by all. It is used with the hands immersed in a basin of water, and in the manner best suited to the person applying it. The improvement is so simple and obvious, that its merits will be appreciated at once.

A patent was issued for a nail brush without the cup, to Dr. W. Thomson, Buffalo, N. Y. (box 1,205) Dec. 27, 1860, and he has taken steps to secure this combination of the cup with the brush. More inforrmation may be obtained from him by letter.

THE SAFETY OF OCEAN NAVIGATION.

There are many persons who suppose that ocean steam navigation has been very disastrous, because a few very prominent steamers have been lost, under certain circumstances—such as the sinking of the *Arctic*, which made such a deep and painful impression upon the public mind. The fact, however, is, that ocean steam navigation is wonderfully safe. Only twenty American and foreign steamships have been lost on the Pacific and Atlantic during the past twenty years. They are as follows:—

		Lives lost.
President	British	130
Arctic	American	300
Pacific	"	240
San Francisco	"	160
Central America	"	387
Independence	"	140
Yankee Blade	"	75
City of Glasgow	British	420
Union	American	none
Humboldt	"	"
Franklin	"	"
City of Philadelphia	British	"
Tempest	"	150
Lyonnais	French	160
Austria	German	456
Canadian	British	none
Argo	"	"
Indian	"	27
Northerner	American	32
Hungarian	British	(about) 120
Total		2,797

The *President*, *Pacific*, *City of Glasgow* and *Tempest* were never heard of; the *San Francisco* and *Central America* foundered; the *Independence*, *Yankee Blade* and *Northerner* were wrecked on the Pacific; and the *Canadian*, *Humboldt*, *Franklin*, *Argo* and *Hungarian* on the Atlantic coast; the *Arctic* and *Lyonnais* were sunk by collision, and the *Austria* was burned. Not enumerated in this list are two-thirds as many more, generally of a class much inferior, which were lost in the California trade.

We hear of the explosion of boilers frequently on steamboats running on our rivers, on which very high pressure steam is used in them all; but we do not recollect of a single ocean steamship having burst her boiler. This immunity from explosions on such vessels must be attributed to the low pressure steam that is carried in them, and also to the care of the engineers, who are generally thoroughly practical and experienced men.

THE VISIT OF THE PRINCE OF WALES TO THIS COUNTRY.—The Prince of Wales sailed from England on the 10th inst. for St. Johns, N. F., and, under the title of Lord Renfrew, will visit the United States. The prince will be accompanied by the Duke of Newcastle and other distinguished noblemen. Notice of his intention to visit the United States was given by the Queen directly to the President, and not through the usual ministerial channel. The expectation of a visit from this distinguished character has already created a stir about our City Hall, and there are signs of another insult to propriety and common sense on the part of the aldermen who want to put a finger into this illustrious pie. We understand, however, that the prince has had the good sense to decline municipal hospitalities, and will travel as a private gentleman. The only formal reception will be at the presidential mansion, where he will renew the acquaintance of our venerable chief magistrate.

A GOLD AND DIAMOND SNUFF-BOX FOR AN INVENTOR.—The Russian Minister at Washington (Baron Stoeckl) has presented to W. H. Webb, of this city, a magnificent diamond snuff-box from the Emperor Alexander, in acknowledgment of the great ship, *General Admiral*, which Mr. Webb built for the Russian navy at his shipyard in this city; and also a diamond ring to Captain Comstock, as a recognition of his services in piloting the vessel safely from New York to Cronstadt. It is not long ago since the Emperor of France presented a diamond box to another American citizen for his invention of a pontoon boat of novel and admirable construction. Americans have also supplied ships to the Turkish navy; and we should not be surprised if the Japanese government were soon to order some vessels to be built in America for their naval or merchant marine service.

CYANOGEN AND AMMONIA.—Baron von Liebig has lately published a paper upon the transformation of cyanogen into oxamyd. He found that if to water saturated with cyanogen, a certain quantity of aldehyde were added, crystalline crusts of oxamyd were sooner or later deposited. The aqueous liquor was saturated consecutively three times with cyanogen, but did not appear to loose its power of depositing oxamyd. The liquid, after the latter substance was separated, acted as if it contained a combination of oxamyd and aldehyde, which was decomposed on boiling. In fact, when boiled, aldehyde distills but very slowly, whilst crystals of oxamyd are precipitated, and the filtered liquid gives, after evaporation, a crystalline residue of oxalate of ammonia.

THE Order of Knighthood of Francis Joseph has been conferred by the Emperor of Austria on Charles F. Loosey, Esq., Austrian Consul-general at the port of New York, as an appreciation of the faithful performance of his services in the position he holds in this country. Mr. Loosey has devoted a good deal of his attention to the arts and sciences, and is also the author of an elaborate work on the patent laws of all nations. He has also been instrumental in introducing American steamboats upon the river Danube. The Austrian knighthood confers upon its recipient many marks of distinction. In this case, it is well bestowed.

BLANKETS IN EL DORADO.—In San Francisco there is a woolen factory in which heavier, cheaper and better blankets are made than any that are imported either from the Atlantic States or Europe. These blankets are all wool, and when it is considered that the Golden State raises very large crops of wool, we have the key to the cheap and good San Francisco blankets.

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THE GREAT SPIKE CASE.

We have heretofore alluded to the great patent case of Burden *vs.* Corning, Winslow *et al*, for infringement of the former's patent, for the hook-headed spike. The jury's verdict in favor of Burden was obtained in the United States Court in 1842; judgment paid at the end of execution. Suits for further infringements were had in 1848, in equity; decided in January, 1853, when defendants were enjoined from further infringement, and an account of the damages ordered to be taken and stated. In the pursuance of this order, in October, 1853, R. H. Walworth was appointed master *pro hac vice*, to take the necessary testimony, He entered upon the duties of his office in April, 1854, and has had the case in his hands ever since.

It now appears (from the Saratoga *Daily News*) that there is likely to be an end to this case; at one time this seemed exceedingly problematical. Judge Hall, of the United States Circuit Court, has ordered that the evidence on the part of the defendants be finally closed on the 15th day of January next, and that the rebutting evidence on the part of the complainants be finally closed on the 15th day of April next. This action of Judge Hall will commend itself to all who love justice, and desire to put an end to such lengthy references. It was feared at one time that the whole amount of damages awarded to the plaintiffs would be consumed before the case got out of the hands of the referee

REFORM IN WEIGHTS AND MEASURES.

BY E. M. RICHARDS.

The only well-digested system of weights and measures is that of France. There are reasons why it would be advisable for the United States to adopt that identical plan, and not an approximately similar one; taking one of our own present measures as the standard:—1. It is already received as the medium through which scientific men of most foreign countries compare their experiments and calculations; and it is therefore already better known than any new system could be. 2. If it should be adopted by the United States, there is a strong probability that it would in time become the international standard of all the great commercial countries; indeed, of the whole civilized world. 3. It would be a step towards inducing harmony amongst the nations of the earth; for it is a truism that the more there is in common amongst them—such as language, origin, religion, government, trade, &c.—the more are the chances of rupture made fewer, and the more are the inducements to peace and reciprocal good-will multiplied.

Previous to the first French revolution, the people of France had a system of weights and measures just as defective as the English, from whom we now derive ours; it was as diverse as it well could be. Each province had its own signification for the terms in use, and one acre in one province did not mean the same amount of land as it did in another; so also of a pound, and all other denominations. There was just the same confusion in France as in England under a similar order of things. In neither country did the various terms bear *a decimal relation to each other*. That was about the most objectionable feature of the whole thing, as professional accountants can readily appreciate.

The French, however, being determined on rectifying this matter (but unlike the English "reform in weights and measures," which only fixed a kind of uniformity in the definitions employed throughout the kingdom, retaining the miserable heterogeneous arrangements of the various tables), went to work in the most thorough and philosophical manner. A commission was instituted during the reign of Louis XV., to determine the principles that were to govern the new arrangement. These investigations were carried on during the succeeding reign, and also under the Convention. As the result of these deliberations, it was decided that all the weights, measures and coins of France should bear certain relations to *the size of the earth;* so that, in case of loss, it would be always comparatively easy to restore the different standards. This was a better plan than that of depending on *the motion of a pendulum;* for, in opposition to the correct observation of such vibrations and the drawing of inferences therefrom, there are great practical difficulties in the way. In addition to this troublesome and unreliable method, some oversights were committed by the British authorities, in omitting to precisely define the nature of the *bress* made use of at certain stages of the operations, so that a very perceptible error might readily creep into any attempt to reproduce the standard of weight if lost.

In accordance with the decision above referred to, the distance from the Equator to the Pole, on the meridian of Paris, was divided into ten million parts, and one of these parts was taken as the standard of length and called one Meter It would be correct to say that such was the intention; but, unfortunately, some error was committed, for the aforesaid quadrant is 738 meters (about 2,420 feet) longer than they determined it to be. This error, however, makes no practical difference; yet it is a pity that the theory was not exactly carried out, or at least as nearly as the means of that epoch would have allowed, for it is likely that, although subsequent and more refined observations would have brought to light some inaccuracy in the work, the difference might have been got to less than about half a mile. From this standard was formed a *decimal* table of long measures; the multiplies of the "meter" being designated by Greek prefixes, signifying "10 times," "100 times," "1,000 times," "10,000 times;" the sub-multiplies being indicated by Latin prefixes, meaning "one tenth of," "one hundredth of," "one thousandth of," as seen by the following table:—

French Table of Long Measure (Metrical system).

Denomination.	Ratio to Standard.	Equal to English feet.
Myriameter.....	10,000 meters	32,808.992
Kilometer.....	1,000 meters	3,280.889
Hectometer.....	100 meters	328.09
Decameter.....	10 meters	32.809
Mete.....	(Standard)	3.28
Decimeter.	1-10th of a meter	0.328
Centimeter.....	1-100th of a meter	0.033
Millimeter.....	1-1000th of a meter	0.003

Of course the above table might be extended, if necessary; but this could hardly be required. The myriameter is rather more than six miles and the millimeter is about the 1-25th of an inch, so that the table has a very wide range—abundant for all practical purposes. The League has been retained, though it has not the same value which belonged to it under the old *regime;* it now equals four kilometers. The quantities of the foregoing table in daily use for determining the distances of places are the meter, the kilometer and the myriameter, as well as frequently the league.

[To be continued.]

USE OF SCENTS BY THE ANCIENTS.—Constantine the Great provided fragrant oils to be burned at the altars of the larger churches in Rome; and St. Paulinus, of Nola, a writer at the end at the fourth and beginning of the fifth century, tells us how, in his times, wax tapers were made for church use, so as to shed fragrance as they burned:—"*Lumina ceratis adolentur odora papyris.*" A perfume in common use, even to this day, was the invention of one of the earliest of the Roman nobles, named Frangipani, and still bears his name. It is a powder or satchet, composed of every known spice, in equal proportions, to which is added ground iris or orris root, in weight equal to the whole, with one per cent of musk or civet. A liquid of the same name, invented by his grandson, Mercutio Frangipani, is also in common use, prepared by digesting the Frangipani powder in rectified spirits, which dissolves out the fragrant principles. This has the merit of being the most lasting perfume made.—*Piesse's Art of Perfumery.*

GLOBES AS SHADES FOR GAS-LIGHTS.—A patent has recently been taken out by Charles Bacon, of London, for making globes for lights double with a space between the outer and inner surfaces for containing water, or any clear liquid, or if a colored light is desired, a colored liquid may be used. An inside common shade may also be employed according to the invention, when surrounded with a double globe containing a fluid between the sides. The gas-burners may be arranged in triangular, quadrilaterial or other form around the inner globe or globes; and the other double globe filled with liquid may also be used. Thus the light will be reflected from one globe to the other, increasing its power in a remarkable manner by the concentration of its rays.

IT is found that the prairie stone, existing in such large quantities just back of Chicago, will make gas as well and as freely as the best coal, yield 50 per cent of pure saltpeter, and a residue be left of as good lime as can be found anywhere. Won't there be a balance that will do for "currency" out West?

APPLICATIONS FOR THE EXTENSION OF PATENTS.

Horse-power.—Daniel Woodbury, of Rochester, N. Y., has applied for the extension of a patent granted to him on the 26th of August, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 30th of this month; and the petition will be heard at the Patent Office on the 13th of August.

Sash-fastener.—James Jones, of Rochester, N. Y., has applied for the extension of a patent granted to him on the 3d of September, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 7th of August next; and the petition will be heard at the Patent Office on the 22d of that month.

Stove.—John H. B. Latrobe, of Baltimore, Md. has applied for the extension of a patent granted to him on the 5th of September, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 17th of August next; and the petition will be heard at the Patent Office on the 1st of September.

Sewing Machine.—Elias Howe, Jr., of Brooklyn, N. Y., has applied for the extension of a patent granted to him on the 10th of September, 1846, for an improvement in the above-named class of inventions. The testimony will close on the 3d of August next; and the petition will be heard at the Patent Office on the 13th of that mouth.

IMPORTANT TO PATENTEES.—It has just been ascertained that an amendment was incorporated into the civil appropriation bill, on the eve of the adjournment, by Senator Davis, of Mississippi, which strikes directly at the mechanical genius of the country. It positively prohibits the purchase, either by the Navy or War Department, of any patented article, however necessary it may be, for the use of those departments, without special authority of Congress, naming, at the same time, the article required. The action of Mr. Davis in this matter, in injecting into the civil and legislative bill matter which could not have been adopted in either the navy or army bills, is unheard of in the history of legislation. It was enacted during the late session of Congress, that all purchases and contracts, when the public exigencies do not require an immediate delivery of the articles, shall be made by advertising for proposals respecting them. No contract or purchase is hereafter to be made, unless the same be authorized by law, or under an appropriation adequate to its fulfillment, except in the War and Navy Departments, for clothing, subsistence, forage, fuel, quarters or transportation, which, however, shall not exceed the necessities of the current year. No arms or military supplies whatever, which are of a patented invention, shall be purchased, nor the right of using or applying any patented invention, unless the same be authorized by law, and the appropriations therefor explicitly set forth.—*N. Y. World, July 8th.*

We have not seen the bill to which this extract refers, and of course, we give it as it appeared in the *World*. It seems to us to be an exceedingly harsh and unwise provision, because an exigency may arise in which an important invention for war purposes may be imperatively demanded, and yet it could not be purchased by either the Navy or War Department without calling a special session of Congress to make a specific appropriation for it. The Washington correspondent of the *Herald* says that there is a report in that city that the recent *snap* judgment law of Senator Davis, forbidding the purchase by the War or Navy Departments of any kind of patented arms, does not apply to Colt's pistol. This is a mistake. It applies to *every* patented article, of whatever name or description, required or likely to be required by either of the departments, from a horseshoe nail to an Armstrong gun or Ericsson propeller. The idea of collecting tolls at the Patent Office from inventors, and then making a law forbidding the purchase of their inventions, especially when they are declared to be the most valuable created, is not only ridiculous but severely unjust. This law of Senator Davis' may have grown out of the fact that when he was Secretary of War he purchased Maynard's primer, at a cost to the government of $75,000, which has proved a total failure. An improvement on this invention has been suggested by Secretary Floyd, which, if successful, may save the government from loss.

CORRECTION.—A Boston correspondent states that the new steamer, *Massachusetts* (described on page 19 of this volume), was not built by the Atlantic Works, but by Harrison Loring, of the City Point Works, Boston.

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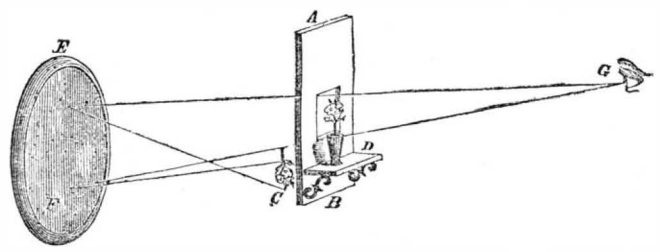
SIMPLE EXPERIMENTS IN NATURAL MAGIC.

MAGIC MIRRORS.

When a person looks into a mirror that is placed perpendicular to another, his face will appear entirely deformed. If the mirror be a little inclined, so as to make an angle of 80°, he will then see all the parts of his face except the nose and forehead. If it be inclined to 60°, he will appear with *three* noses and *six* eyes; in short, the apparent deformity will vary at each degree of inclination; and when the glass comes to 45°, the face will vanish. If, instead of placing the two mirrors in this situation, they are so disposed that the line of junction is vertical, their different inclinations will produce other effects.

THE PHANTOM BOUQUET.

Behind the partition, A B (see the figure), place, in a position somewhat oblique, the concave mirror, E F, which must be at least ten inches in diameter, and its distance from the partition equal to three-fourths of the distance of its center or focus. In the partition make an opening of seven or eight inches, either square or circular; it must face the mirror and be of the same hight with it. Behind this partition place a strong light, so disposed that it may not be seen at the opening, and may illumine an object placed at C, without throwing any light on the mirror. Beneath the aperture in the partition place, in an inverted position, the object, C. that you intend shall appear on the outside of the partition, and which we will suppose to be a bouquet of flowers. Before the partition, and beneath the aperture, place a little flower-vase, D, the top of which should be even with the bottom of the aperture, in order that the eye, placed at G, may see the flowers in the same position as if the stalks came out of the vase. Take care to paint the the space between the back part of the partition and the mirror black, to prevent any reflections of light being thrown on the mirror; in a word, so dispose the whole that it may be as little enlightened as possible. When a person is placed at the point G, he will perceive the flowers that are behind the partition, as if they were growing in the vase: but on putting out his hand to pluck them, he finds that is grasping a shadow.



THE REVIVIFIED ROSE.

Take a rose that is quite faded, and after throwing some common sulphur on a chafing-dish of hot coals, hold the rose over the fumes, and it will become quite white. Then dip it in a basin of water, and giving it to any one, tell him to put it in his drawer or box and close the place tightly. Five or six hours afterwards, tell him to open the box, and he will find, to his astonishment, instead of the white rose he put there, a rose that is perfectly red.

ETCHING BY THE SUN.

Dissolve chalk in aqua-fortis, to the consistence of milk, and add to that a strong solution of silver. Keep this liquor in a glass decanter, well stopped. Then cut out from a paper the letters or design you would have etched, and paste the paper on the decanter, which you are to place in the sun, in such a manner that its rays may pass through the spaces cut out of the paper and fall on the surface of the liquor. The part of the glass through which the rays pass will turn black and that under the paper will remain white. You must observe not to move the bottle during the operation.

EXPLOSIONS OF STEAMBOATS.—We are afraid that some of our western Steamboat Inspectors have become careless in the performance of their duties. Two terrible explosions have recently occurred—the one was that of the steamboat *Benj. W. Lewis*, at Cairo, on her passage to St. Louis; the other, the propeller *Kenosha*, at Sheboygan on Lake Michigan. By the first, about fifty passengers lost their lives; but by the latter only two of the crew. The scene which took place by the former explosion was heartrending, as the boat also took fire and burned down to the water's edge.

CURRANT WINE.

As the present is the proper season for making this cordial, we give the following old, but good receipt for its manufacture. When properly made, it is a very healthful beverage, particularly for summer drink, when fully diluted with water. Before pressing the juice from the currants, pass them between a pair of rollers to crush them, after which they must be placed in a strong bag, and they will part with the juice readily with light pressure, such as a common screw, heavy weights, &c. To each quart of juice add three pounds of double refined loaf sugar—single refined sugar is not sufficiently pure—then add as much water as will make one gallon. Suppose the cask intended to be used is 30 gallons. In this put 30 quarts of currant juice, 90 pounds of double refined sugar, and fill the cask to the bung with water; roll it over until the sugar is all dissolved. This will be told by its ceasing to settle in the barrel. Next day roll it again, and place it in a cellar where the temperature will be sure to be even. Leave the bung loose for the free admission of air. In the course of one or two or three days, fermentation will commence. By placing the ear to the bunghole a slight noise will be heard such as may be observed when carbonic acid is escaping from champagne or soda-water. Fermentation will continue for a few weeks, converting the sugar into alcohol. As soon as this ceases, drive the bung in tightly, and leave the cask for six months, at the end of which time the wine may be drawn off perfectly clear without any excess of sweetness.

THE MANUFACTURE OF SUGAR AND GAS IN GERMANY.

MESSRS. EDITORS:—I embrace the first leisure opportunity to inform you of my safe arrival in Germany. Perhaps the following lines may embrace topics of interest to some of your readers:—

All inventions concerning cane sugar are of very little interest for Germany. There are, at present, at least 300 factories, where sugar is manufactured only and exclusively out of sweet turnips; and the manufactured article is so perfect that cane sugar can hardly compete with it, although the duties on cane sugar are not very high. These factories are in the German Custom Union (*Zollverein*) alone; and I understand that Austria is just as well off concerning the manufacture of sugar from sweet turnips. Thus Germany, like France, is entirely independent of foreign countries in regard to its wants of sugar.

A convention of gas manufacturers in Nuremberg (in which twenty-five of the prominent cities of Germany are represented) has under consideration the following subjects:—

1. *The employment of clay retorts.* What are their advantages and defects; will it be best to discontinue their use altogether?

2. *The quality of the light.* Is it practicable to introduce a standard light for every place throughout Germany? What are the best means for determining the quality of the light?

3. *Improvements in the gas pipes.* What are the principal defects of the present system of gas pipes? How can these defects be remedied?

4. *A new method of purifying the gas.*

5. *Manufacture of gas from different kinds of wood.* Which is the best method of treating different sorts of wood? How do different kinds of wood differ in regard to the yield of gas?

6. *Different qualities of coal for the manufacture of gas.*

7. *Theory of light, as far as it relates to the subject of illuminating gas.*

8. *The administration of gas-houses.*

In regard to the first point—concerning the employment of clay retorts—it is generally asserted that the gas made in such retorts is poorer in quality, although the yield in *quantity* is greater than in iron retorts; thus benefiting the manufacturers but not the consumers. This point, as well as the other points above enumerated, will be thoroughly sifted by the convention, and the reports on those subjects will probably be of more than common interest. I shall endeavor to obtain these reports, and give you the substance of the same as soon as practicable. L. K. BREISACH.

Augsburg, Germany, May 26, 1860.

A COLUMN OF VARIETIES.

A large steam excavator is now being built at Boston for Messrs. Norris & Louther, the American contractors for the Sagua Railroad in Matanzas.

It is stated in one of the London papers that cramp in the legs may be instantly cured if, on the moment of its seizure in the calf of the leg, the instep is forcibly drawn up. This method, which can be easily tried, may be of the most important benefit to bathers.

When a current of ordinary coal gas is passed through a neutral solution of nitrate of silver, a crystalline precipitate is obtained, formed of a large quantity of little prisms, which, when dry, detonate under the action of heat or the blow of a hammer, like fulminating silver.

The first locomotives in the United States were imported from England in the Fall of 1829, or Spring of 1830. The first Stephenson locomotive ever imported was the "Robert Fulton," in 1831, for the Mohawk and Hudson Railroad. The first locomotive built in this country was constructed at the West Point Foundry, in the State of New York, in 1830, for the South Carolina Railroad.

To prevent forked trees from splitting—to which they are liable—it is recommended that a few of the smaller limbs above the fork be twisted together, in which position they will grow and protect the fork.

MM. Jardin and Blancoud, of Paris, have been applying hydrofluoric acid to engrave upon porcelain. The latter is first covered with a varnish upon which the drawing is made with a fine point, when the porcelain is placed in a bath containing hydrofluoric acid in the state of a vapor, which eats out the lines forming the picture. The porcelain is then placed in a bath containing gold or silver in solution, and a deposit is made of the metals with a galvanic battery; no deposit is made on the surface covered with the varnish.

In Green county, Va., there is a spring of water that flows in a volume sufficient to drive a 4-horse-power wheel, for about twenty minutes; then it ceases to run, for about two hours, when it will flow again, and so on, continuously.

A French commission, appointed to examine into the means of destroying insects which prey upon grain that is stored up, have reported that a small quantity of chloroform or sulphuret of carbon put into the interior of a grain pit, and then hermetically sealed up, will destroy all the pests. About 75 grains of sulphuret of carbon are sufficient for about four bushels. Grain placed in a heap and covered with a tarpaulin may be effectually treated thus to destroy such insects.

A paper has been communicated to the *Moniteur Scientifique* by M. de Luca, professor of chemistry in Paris, detailing the result of an analysis of one of those wonderful plants that vegetate suspended in the air without any contact with the soil. He found that such a plant as the *Tillandria dianthoidea*, after being burned, contained 10 per cent of ashes, in which were silica, lime, magnesia, potash, soda, phosphoric acid and a very appreciable quantity of iron, manganese, sulphuric acid and chlorine. This plant must have attracted its mineral elements from the dust which was floated on the breeze.

The basis of most of the substances which people term rocks, minerals, salts, &c., is a metal. Thus, rock lime, when deprived of its carbonic acid by burning, is oxyd of calcium—the rust of the metal calcium. This metal is very rare and is almost as combustible as turpentine. The very salt which we consume with our food is composed of chlorine and the metal sodium. The latter, when thrown into water, absorbs oxygen rapidly, decomposing the water, and evolving hydrogen and steam.

Sir David Brewster, inquiring into the history of the stereoscope, finds that its fundamental principle was well known even to Euclid; that it was distinctly described by Galen 1,500 years ago; and that Giambatista Porta had, in 1599, given such a complete drawing of the two separate pictures as seen by each eye, and of the combined picture placed between them, that we recognize in it not only the principle but the construction of the stereoscope.

There is now on exhibition, at Colyton (England), a single sheet of tissue paper which measures very nearly *four miles* in length (21,000 feet), and which is 6 feet 3 inches in breadth. The weight of this sheet is only 196 pounds. It was manufactured in 12 hours.

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IMPROVED GAS COOKING STOVE.

The most convenient and cleanly stove for cooking and general domestic purposes is one in which the common coal-gas that is employed for illumination is used; and within five years they have been, to a considerable extent, introduced in some portions of the country; and as the article of gas for illuminating purposes becomes more general, we are confident it will be extensively used for heating dwellings, cooking and other domestic purposes. Gas can be ignited in a moment, and the heat can be regulated with the utmost precision by simply graduating the quantity to be consumed, so that there is no necessity of waste of heat or material.

The accompanying engravings represent a very neat and compact stove of this character. A is the oven cover, which is made of sheet iron and fitted into a rim, B. The pipes, P, are for conveying the gas to the burning chambers. The conical gas chambers, D, are secured on the top of a neat stand, C, and the pipes have cocks to let-on and shut-off the gas, as required. The tops of these chambers are covered with wire gauze, which spreads the gas so as to form a sheet of flame over the entire surface. When it is ignited it gives out a most intense heat, with a blue flame which has but a moderate quantity of light. Vessels for cooking--such as kettles, &c.--may be placed upon the top of the covers above the wire gauze issues, E. The small projections shown upon the covers support the vessels a suitable distance above the flame, and admit the air to supply the combustion.

Fig. 2 represents a small stove of this character, well adapted for restaurants, or for hatters, tailors, &c. It is now several years since we first directed attention to the suitableness of gas for cooking, especially during warm weather. It affords us pleasure to witness such a compact and neat adaptation of apparatus as this for thus using it. This gas stove will be readily understood from the foregoing description. It is simple in all its parts, and weighs but a few pounds; yet it is adapted for baking, roasting, boiling, &c., as well as heating sad-irons, and almost any other purpose to which heat is applied in the kitchen.

The patent for this invention was issued to Thomas Shaw, on Dec. 14, 1858; and further information concerning it may be had by addressing him, at No. 243 Race-street, Philadelphia, Pa.

Fig. 1

Fig. 2

SHAW'S IMPROVED GAS COOKING STOVE.

IMPROVED LOCOMOTIVE AND CAR WHEEL.

The accompanying engravings will convey an idea of the form of this wheel, a patent for which has been granted to Thomas S. Bourshett. Fig. 1 represents a front view of a car wheel; Fig. 2 a cross section of the same. It combines lightness and durability, and it is claimed for it that it possesses greater strength than any other wheel in use.

This invention or improvement consists in casting the rim or tread, arms, and portions of the wheel surrounding the hub, hollow; of uniform thickness, excepting at the joints of connection of the parts; and curved in form, so as to provide entire security against all shrinkage by one part becoming fixed or cooled before another; the distinct parts thus accommodating themselves to each other in the manufacture, and preventing any imperfection of result from contraction in the process of cooling.

The principle of construction of this wheel is that of the greatest strength in physics, to resist pressure and weight, namely, the arc of a circle: all the force is exerted on curved surfaces, and consequently this wheel embodies more effective resistance to the strains, racks, twists and sudden jolts to which railroad wheels are constantly subjected, than can be affirmed of any other wheel; the tests to which it has been put having fully confirmed all that is claimed for it.

All other attempts to make cast iron railroad wheels with spokes for common use have been unsuccessful; the usual form of carriage wheel having been adopted, that is, straight spokes connceted with the rim and bent at right angles; they were found to be deficient in strength, and were liable to crack at the points of connection. They were therefore abandoned, and the solid wheel substituted for general use. These have been cast in every variety of form, some with a solid single plate, and some with double plates having a hollow between them. That they have not fulfilled the great *desiderata* of strength, durability and economy, the vast annual consumption of wheels on our roads will fully attest. Let the report of any railroad be consulted, on which heavy freights and great numbers of passengers are transported at a high rate of speed, and the large annual charge for renewing wheels will strike any one with astonishment. This great destruction of wheels is owning, not alone, to their wearing out by use, for a well-chilled wheel will run a long time, but from their breaking and cracking; the slightest crack making it imperative to discard a wheel. In the North and in the Northwest of this country, especially, the extreme cold of winter, causing great contraction in the metal, entails a ruinous destruction by cracking, in some forms of wheels. Now that economy in the management of railroads and every possible reduction of expenses have been forced on their managers, on no one item of expenditure can a greater saving be made, than on the outlay for wheels, provided a stronger wheel can be obtained than those now in use.

Fig. 1

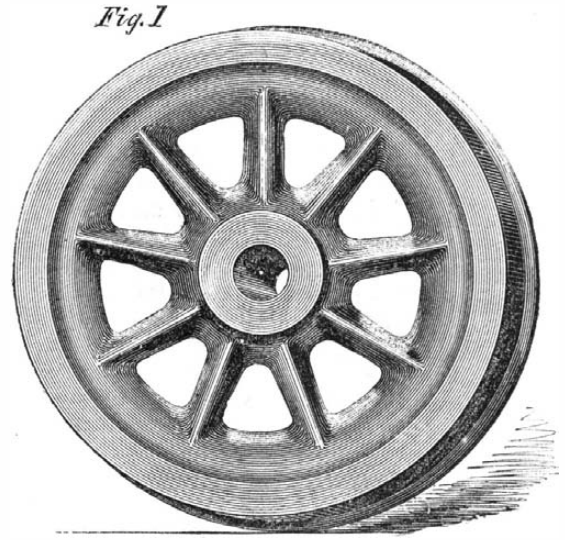
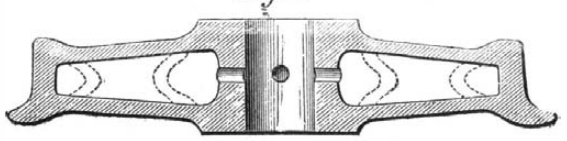


Fig. 2



BOURSHETT'S CAR WHEEL.

As regards beauty and lightness of appearance, the comparison between a solid plate wheel and one with well-formed spokes must be altogether in favor of the latter. Whoever has seen one of William Mason's locomotive engines (of Taunton Mass.) could not have failed to observe the grace and beauty of finish imparted to it by this wheel. Mr. Mason uses no other form of wheel under his locomotives, which, while they possess all the strength, durability and power of any other that can be made, as much surpass in attractiveness and taste the lumbering, ungraceful, heavy-looking engines of a few years ago as a modern American clipper ship surpasses a Dutch galliot whose naval architecture dates a century back.

The Baltimore and Ohio Railroad Company have adopted this wheel, and it is extensively used on that road. It is also much used on the Illinois Central and other roads. We trust that it will receive attention from those who are interested in securing what we believe to be the best wheel yet invented. Its qualities can be easily tested by trial.

By referring to an advertisement on another page, further information in regard to it will be found.

AN INVENTOR WHO DESERVES A REWARD.—Newark, in New Jersey, is one of the most enterprising manufacturing places in our widely-extended country; and for much of its business is it indebted to an industrious and ingenious mechanic who is now considerably advanced in life. This man is Seth Boyden, who, while benefiting Newark and her citizens, did not do so for his own aggrandizement. He established the patent leather and malleable iron manufactures in that place, and he is the inventor of quite a number of useful improvements in machines for splitting leather; also, an automatic governor cut-off valve for engines, the straight axle with outside connections for locomotives, and various other useful mechanism. The citizens of Newark are talking about making some demonstration to evince their gratitude to him. We hope this will not end in talk, as he deserves to have a substantial life annuity granted to him.

STEAM CARRIAGE IN CALIFORNIA.—A steam carriage for common roads has been imported from England by the Arizona Copper Mining Company, and it has been running on several occasions in the streets of San Francisco. It weighs 11 tuns, and the power is not applied by connecting rods to drive the axles of the wheels, but through a train of wheels like Fawkes' steam plow. The San Francisco papers consider it unfit for their roads, as it was scarcely able to draw a load of 9 tuns.

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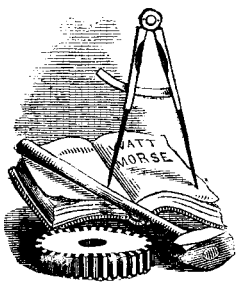
VOL. III., No. 4.....[NEW SERIES.]....*Sixteenth Year.*

NEW YORK, SATURDAY, JULY 21, 1860.

THE AGE OF INVENTION.



VERY sensible mechanic once made the remark to us, respecting a certain machine, "It is very ingenious, but there is not much invention about it." The idea couched in these words, we thought, was contradictory, and so we asked for an explanation, when he replied: "I mean by *ingenuity* a very complicated combination of devices to produce a result that is not very useful; by *invention* I mean the most simple arrangement of the fewest number of devices to produce a truly useful result." There is, perhaps, more truth and shrewd observation in these remarks than may appear at first sight. This is truly the age of great inventions; and yet, if we look to other eras, we find that as much mechanical ingenuity has been exhibited as at the present day. We read in ancient memoirs that Jean de Montroyal presented to the great emperor, Charles V., an iron fly which made a circuit around the inventor's head, then alighted on his arm and closed its wings, as if it were fatigued. This toy certainly exhibited a wonderful amount of mechanical ingenuity. In 1738, Vaucanson constructed one figure which played upon the flute, another that performed on the tambourine, and an artificial duck which moved its head, eat and drank, flapped its wings, swam on the water, dabbled with its bill and quacked like any living duck. These feats of mechanical ingenuity were exhibited publicly in Paris, and they certainly evinced as *great* powers of mind for combining and arranging mechanical devices as were ever witnessed in any age; but as they were designed for purposes of amusement merely, they do not deserve—according to the idea we wish to establish—the dignity of being called "great inventions." We wish to inculcate a more sacred regard for the efforts of those men who invent improvements that are designed for the benefit, rather than the amusement and wonder, of men; hence we think that *invention* should always be associated with the idea of *utility* and *good* to mankind.

This is truly the age of invention. The great feature which distinguishes it from every other is the uniform and constant effort of inventors to construct machines for saving severe human labor—a noble aim for a noble end. Some sentimentalists have called this a "mechanical age," and have done so in a taunting spirit, as if mechanical progress were opposed to intellectual cultivation. The fact is that this is the most intellectual age the world has ever seen; and this is due in a superlative degree to the application of mechanical genius to useful purposes. The invention of the printing press has given us cheap periodicals and books, and by these knowledge has increased, and the general intellect of the whole civilized world has thereby been improved and refined. By labor-saving machinery, thousands of men and women, who were aforetime "yoked with the brutes and fettered to the soil," have been lifted from their hard lot and advanced to more intellectual occupations. The cases of this character are so numerous that we have not space to name them, but for their sake we ought to name this "the age of invention."

With modern inventions we are enabled to travel faster and cheaper, to cultivate the soil with less labor, to traverse the ocean more safely and quickly, and to communicate with distant friends in an instant; in short, there is not an art, a manufacture, nor a single pursuit for business, or needful pleasure, which has not been elevated and benefited by our inventors. It must be a source of great pleasure to every sensible person to witness the great augmentation in the number of patents issued weekly, with their claims, as published in our columns; it is the best evidence we have of the progress and general elevation of all classes, it is the most cheering "sign of the times." Every improvement and discovery, of a useful nature, is a benefaction to the world; every inventor is a benefactor; and this is "the age of invention."

THE ART OF POISONING.

About one hundred and fifty years ago, there was living in Naples, in a quiet way, a certain Madam Tofana, who was destined to occupy a conspicuous place in history. She lived to a great age, namely, seventy years, and then was not ready to "pay the debt of nature," but she was cut down in the midst of her active career by violence; she was *hanged*. The claim of this woman to a place in history is based upon her skill in poisoning—an art which was much esteemed and practiced in her day, and numbered among its zealous votaries and patrons the highest dignitaries of the church and state. To believe the stories current in Tofana's time, there were wonderful poisons, and altogether above the knowledge of our modern chemists, for there were poisons conveyed in rings, gloves and handkerchiefs, which killed by the odor they exhaled, by the touch and almost at sight. But the most notorious of the artists this Tofana (who could reckon up six hundred tombs, as the monuments of her skillful practice before her real "virtues" became known), made use of what in our days is considered one of the crudest and most vulgar of poisons—arsenic.

The fact is that the ancients and the notorious poisoners of the 15th and 16th centuries knew as little about the chemistry of poisons as of other substances, and that the stories about them, are to be ranked with the stories of ghosts, witches and sorcery. There were poisoners, and they had plenty of victims; and it was only by reason of the gross ignorance and superstition of the people, that the clumsiness of their work was not detected. All the little chemical skill of those days was monopolized by physicians and priests; and the vulgar herd saw, with big eyes, whatever did not coincide with the most ordinary experience.

But the poisoners of our time have a very extensive *materia toxica* from which to select their subtle "charms." There are poisons which take life with the swiftness and certainty of a bullet, or death may come after a long sleep, or with pleasant dreams, or with pain worse than torture. The poisoner may procure the material for his business, skillfully prepared, of any apothecary. Poison is cheap; a few cents will buy enough arsenic to "extinguish" a family, and a homœpathic dose of some things is enough for a stout man—a sixth of a grain of strychnine, for example.

Luckily for those who desire to die a natural death, the power of the poisoner is circumvented. Every bane has its antidote, and every poison gives unmistakable evidence of its work and its presence. No crime is detected and punished with such certainty as poisoning. The murderer who uses the pistol, bludgeon or knife, often escapes; but how rarely the poisoner! We have only to recall the recent cases of Palmer, Smethurst, Stephens, Hartung, Harden and others, to understand the reason. Each poison is a peculiar kind of matter, and has characteristic properties, and the skillful chemist as readily distinguishes one from another as we do butter from cheese, pepper from salt, or Jones from Brown. The chemist knows the properties of poisons by his senses; he knows how they smell, taste or appear to the eye. If the particle is too small to be seen by the eye, he magnifies it, when it may be as readily examined as a stone or a flower. He tries the effect of heat, acids, alkalies and other re-agents; and when he reaches his conclusion, it is of the most positive character—the identification need not be more perfect.

Mineral poisons remain in the body after death, forming a perpetual testimony of crime. If the bodies of Tofana's victims could be exhumed, the chemist would make his investigation for poison with as much confidence as in a case of the present week.

Thus it appears that, although Science has furnished facilities for the commission of crime, she still serves the cause of Justice and Virtue by pointing out the means for its certain detection.

WATER GAS.

Mr. Paine, and others who have made so many promises of gas and light from water, must "look to their laurels," for what they only *talked about*, appears to have been accomplished by Frenchmen. The city of Narbonne, in France, has been lighted by genuine water gas for nearly three years. The so-called water gas of White, Sanders and others, is only a mixture of hydrogen with coal or resin gas, but the Narbonne gas is pure hydrogen.

The first process at Narbonne was to decompose water by passing steam through a highly heated retort containing coal. The explanation of the decomposition is that the carbon takes away the oxygen from the water, thus setting the hydrogen free; the carbon and oxygen combine and become carbonic acid and carbonic oxyd. The chief objection to this process is, that the heat required to effect the decomposition is so great that the retort is soon destroyed; hydrogen produced in retorts, by the best management, would probably cost more than oil, coal or resin gas. But lately at Narbonne they have entirely dispensed with retorts, and decompose the steam by passing it directly into the furnace. The furnace of the cupola form, is charged with coke, the fire urged by a blast, and when the whole is intensely heated the blast is shut off, the flue closed, and steam at 30lbs. is let in. The steam is decomposed and the gases pass away to the purifier and gasometer. This system seems plausible, but requires the practical test to fix its value.

The gas generators erected at the above place have been in successful operation about six months, have cost nothing for repairs; and M. Fages, the inventor, thinks they will last an indefinite period. Each generator produces 30,000 feet of gas in 24 hours, at a cost for materials (coke, coal and lime) of about 80 cents per 1,000. The period of admission of steam and generation of gas is about 20 minutes; of the re-heating, four or five minutes.

The gas thus produced on burning gives little light but great heat. Light is secured by adjusting over the burners coils of fine platinum wire.

SCIENTIFIC VS. PRACTICAL INSTRUCTION.

A recent number of *Silliman's Journal* contains the following testimony of Liebig, as to his famous school at Giessen; it is worth considering in these days of practical science:—"The technical part of an industrial pursuit can be learned; principles, alone, can be taught. It is only after having gone through a complete course of theoretical instruction in the lecture-hall that the student can, with advantage, enter upon the practical part of chemistry He must bring with him into the laboratory a thorough knowledge of the principles of the science, or he cannot possibly understand the practical operations. If he is ignorant of these principles, he has no business in the laboratory. In all industrial pursuits connected with the natural sciences—in fact, in all pursuits not simply dependent on manual dexterity—the development of the intellectual faculties by what may be termed school learning constitutes the basis and chief condition of every improvement. A young man, with a mind well-stored with solid scientific acquirements will, without difficulty or effort, master the technical part of an industrial pursuit; whereas, in general, an individual who is thoroughly master of the technical part may be altogether incapable of seizing upon any new fact that has not previously presented itself to him, or of comprehending a scientific principle and its application."

A GUN invented by Gilbert Smith, and manufactured by Poultney & Trimble, of Baltimore, has completely eclipsed the Sharp arms, and it is to be adopted in the army. Gov. Moore, of Alabama, has ordered enough of these weapons to arm two companies of cavalry; it being well adapted for use on horseback.

THE attention of the traveling community, as well as that of railroad companies and locomotive and car builders, is directed to the description of Bourshett's patent car wheel, illustrated in another column.

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BUTTER-MAKING.

The following article on butter-making is contributed to the *Rural New Yorker* by A. D. Burt, who has taken many premiums in New York State Fairs. His views deserve general attention because a great deal of bad butter finds its way to our markets, owing to the want of correct information in making and packing it.

Mr. Burt says:—"First, I consider that it is absolutely necessary to have good, sweet pasturage, with an abundance of the best grasses, and an unstinted supply of pure fresh water, not such detestable stuff as can be found in stagnant pools, but such as you behold when you "see the rill from the mountain joyously gleam," where the cows can slake their thirst and feel invigorated. The pasture should have shade trees sufficient to accommodate all, without the necessity of disturbing each other in the excessive heat of midsummer. Then have cows suitable for a butter dairy; not those that give the largest amount of milk, but the richest, yielding a large supply of the rich orange-colored cream. The cows should be salted regularly, at least twice each week, as it will keep them in health and in a thriving condition, which is needful for profit. Always be sure to drive them carefully to and from the pasture; never allow them to be worried by boys or dogs, as it will tend to heat the milk and often cause great delay in the churning, which some will impute to witchcraft, and that correctly, but the witchery, I believe, is in over-heating the inoffensive cow and often causing injurious effects upon the poor dumb beast.

Always be regular in your time for milking, and let one person (as much as possible) milk the same cow or cows, and be sure to milk them as quickly and thoroughly as possible, for you thereby save the richest part, and often save knots from forming in the teats, or causing a milk fever, or inflammation in the udder. A clean, cool, airy and light room (the lighter the better) is the most suitable place for the pans, and racks instead of shelves, is considered the best, as the air can circulate freely around the pans, cooling the milk more evenly. A common house cellar will very seldom be found a suitable place for setting milk, and the cream or milk in a cellar should never be placed on the floor or bottom, for if there is any impure gas in the cellar it will settle to the ground, causing the cream to be bitter, and a poor quality of butter will be the result.

After setting the milk away it should never be disturbed again until it is ready to be skimmed, which should be done as soon as possible after the cream has risen and before the milk has curdled; all the gain there is in quantity after about twenty-four hours' setting you must lose in quality. Keep the cream in stone pots or jars, in a cool place in summer (moderately warm in winter). Sprinkle a little salt on the bottom of the jar. Always stir the cream from the bottom every time you add a fresh skimming of milk. Never churn until at least twelve hours after the last cream has been put into the jar.

After the cream has been churned and the butter properly gathered, it should then be washed in cold water and changed two or three times, or until there is no coloring of milk about the water; the whole of the water must then be worked from the butter, and it should be salted with about twelve ounces of the best Ashton dairy salt, well pulverized, to sixteen pounds, or three-fourths of an ounce to each pound of butter. The salt should be evenly worked through the entire mass. I differ much with many of our butter-makers in the quantity of salt, but I have taken the first premium at our county fair (in the Fall) on June-made butter that was salted with half an ounce to each pound, and packed immediately, without a second working, and that butter, when thirteen months old, was just as sweet as when first packed.

Always pack immediately, as it tends to make it streaked if it is worked a second time. It should be packed in jars, if for home use; if for market, in the best oak firkins or tubs, which should be well soaked with cold water, then scalded and steamed by pouring boiling water in, and covering to keep the steam in for a short time, say twenty or thirty minutes. Then pour off the water and scrub the firkin with salt or with soda, then wipe out the surplus, give it a slight rinse and, when cooled, it is ready for use. When the firkin or jar is full, cover the butter with good sweet brine, to exclude the air."

INDUSTRY—MANUFACTURES—COMMERCE.

The price of admission to the *Great Eastern* was reduced from one dollar to fifty cents on Monday, last week. Since that period, the number of visitors has increased from 1,500 to 6,500 daily. If the charge were reduced to 25 cents on certain days, as we have before suggested, ten or twelve thousand persons would visit her daily.

The American Photographic Society held its last meeting at the Cooper Union on the evening of the 9th inst. Papers were read upon subjects connected with photography, after which the project of founding a photographic college was discussed. The necessity was urged of forming an efficient corps of photographers, employed by the government, for the purpose of taking accurate views of forts and other buildings or scenes that might be required.

It is with unfeigned regret that we announce the sudden decease of Mr. John A. Bunting, of this city. The event took place on the 6th inst. He was for several years one of the most active managers of the American Institute, and president of the Mechanic's Society, and was highly esteemed by the mechanics of this city.

The Secretary of the Treasury has invited proposals, till the 10th of September, for the use by the government of the line or lines of magnetic telegraph from the west line of Missouri to San Francisco, under the recent act of Congress; the lowest offer to be accepted, and guaranty given for the performance of the service.

The St. Louis Vine and Fruit-growers' Association have commenced laying-out, near that city, a grand horticultural park of 1,000 acres, to be filled with choice grapes and fruits. One hundred men are employed in planting the first one hundred acres.

It has been customary, heretofore, for the gas companies in this city to charge a deposit-fee for their meters before they would supply new customers with gas. This course they have been compelled, by law, to abandon. Mr. Peckham, the lessee of a new store on the corner of Broadway and Thirteenth-street, refused to pay this deposit, and so the gas was withheld from him by the Manhattan Gas Company. He then applied for a mandamus from Judge Ingraham, of the Supreme Court, to compel the company to furnish him with gas, and the judge granted the request of the petitioner last week. The company, therefore, has now furnished the gas without exacting a deposit for the meter.

Messes. Gilbert & Co. have erected works for making oil from asphaltum, near Los Angeles, Cal. There is a great abundance of asphalt in that section of the country, and oil may be obtained from it as easily as from coal.

The old Kerosene Coal Oil-works, near Williamsburgh, L. I., which were sold by auction some weeks ago and purchased in the name of Peter Cooper, are again in full blast, making great quantities of the oil. None of the old company, we understand, are connected with the present management of the works.

The United States Agricultural Exhibition will be held at Cincinnati from September 12th to the 20th. The premium list amounts to $20,000. No cattle will be received, on account of pleuro-pneumonia, but large premiums will be offered for horses, machinery, steam fire-engines, &c.

The West Washington market shanties, bordering on the North river, at the lower part of this city, were burned down on the night of the 11th inst. They covered a space of about four acres, and were filled with meats, vegetables, fruits, butter, cheese, &c. A very great quantity of provisions were destroyed; but the buildings themselves were a set of old wooden "rattle-traps"—a disgrace to the city.

Some conception of the vast consumption of wire in the manufacture of ladies' skirts may be obtained from the fact that Messrs. Washburn & Moen, of Worcester, Mass., are turning out 240,000 feet of wire daily for this purpose.

A GOOD BLACKBERRY WINE.—To make a wine equal in value to port, take ripe blackberries, press the juice from them, let it stand 36 hours to ferment (lightly covered) and skim off whatever rises to the top; then, to every gallon of the juice, add 1 quart of water and 3 lbs. of sugar (brown will do); let it stand in an open vessel for 24 hours; skim and strain it, then barrel it. Let it stand 8 or 9 months, when it should be racked off and bottled and corked close; age improves it.

TEACHING THE SCIENCES.

The *Educator*, published at Quakertown, Pa., coutains the following very sensible remarks on the kind of information which should be installed into the minds of our youth in schools.

"We think the natural sciences should be taught in every school. Before the pupil commences the study of the grammar, arithmetic, or even geography, he can be made acquainted with the physical sciences; for we conceive that, if properly taught, the young mind will take them up and relish an acquaintance for them, much sooner than any of the other branches to which we have atluded. They are called the natural sciences, and so they should be, for, though not so named from the fact, yet they seem to be natural, even to the child.

"Children, when quite young, commence to reason, and to ask questions involving the principles of physics. To encourage them in this, by gratifying their curiosity will not only develope their intellect and stock the mind with useful knowledge, but it will lay the foundation for that which will be of greater utility than grammar, arithmetic, or geography, valuable as these may be. Teacher and parent, teach your children early philosophy and chemistry! We do not mean that you should employ text books, or deliver lectures in doing this. There are hundreds of opportunities presented daily in the school room, and in the family, when it can be done. Improve these occasions, answer every question involving a principle which you can explain, illustrate your remarks, perform experiments if you have apparatus, and if not make them. There are numberless experiments, which can be make in the school room, and are comprehensible, if properly explained, to the youngest pupil."

CURE FOR IN-GROWING NAILS.—It is stated, by a correspondent, that cauterization by hot tallow is an immediate cure for in-growing nails. He says:—"The patient on whom I first tried this was a young lady who had been unable to put on a shoe for several months, and decidedly the worst case I have ever seen. The disease had been of long standing. The edge of the nail was deeply undermined; the granulations formed a high ridge, partly covered with skin, and *pus* constantly oozed from the root of the nail; the whole toe was swollen, and extremely tender and painful. My mode of proceeding was this: I put a very small piece of tallow in a spoon, and heated it over a lamp until it became very hot, and dropped 2 or 3 drops between the nail and granulations. The effect was almost magical. Pain and tenderness were at once relieved, and in a few days the granulations were all gone, the deceased parts dry and destitute of feeling, and the edge of the nail exposed so as to admit of being pared away without any inconvenience. The cure was complete, and the trouble never returned. I have tried this plan repeatedly since, with the same satisfactory results. The operation causes but little if any pain, if the tallow is properly heated. A repetition might, in some cases, be necessary; although I never have met with a case that did not yield to one application. Admitting the theory of Dr. Lorinser to be correct, the *modus operandi* is very plainly to be seen. The liquid cautery insinuates itself in every interstice, under the nail, accomplishing in one minute, without pain, all that can be effected by the painful application of nitrate of silver for several weeks.—*Medical and Surgical Journal.*

THE Tennessee State Fair will be held at Nashville, from the 10th to the 15th of September, inclusive.

RECENT AMERICAN INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

FILE-CUTTING MACHINE.

This invention consists in a certain mode of applying the chisel stock in a file-cutting machine, whereby the chisel is caused to operate in such a manner as to tend to throw up or raise the edge of the cut above the surface of the file blank in a similar manner to that in which it is done in cutting files by hand: also in a certain construction of the chisel stock, whereby the cutter may be caused in its operations to adjust itself to the

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face of the file blank as to cut to a uniform depth all across the blank; also in certain means of controlling the force applied to the chisel to produce the cut, whereby such force is proportioned to the widths of the several parts of the blank, and consequently to the resistance offered to the cut, and hence the cuts are made of uniform depth from end to end of the file, notwithstanding its various widths; also in an improvement in the means attached to the file bed for securing the ends of the file-blank; and in an improved contrivance which presses down the blank upon the bed at a point near the chisel, but which is removed from the file at the time of the feed movement thereof; also in an improved arrangement of the file carriage in combination with the feeding mechanism, to provide for the adjustment of the carriage to vary the angle of the cut, without disturbing the feed mechanism. The credit of this invention is due to J. C. Cooke, of Middletown, Conn.

REVOLVERS.

This invention relates to revolvers of that kind which have a many-chambered cylinder rotating on an axis parallel with a stationary barrel. The principal object of the invention is to provide greater facility for the loading of the chambers at the rear of the cylinder; and to this end it consists in so applying a chambered cylinder having the chambers extended through the rear in combination with a frame opening with a hinge joint, that when the frame is opened the cylinder remains attached to and swings with the front part of the frame. It also consists in the construction of the hinge-jointed cylinder frame with chambers in its front and rear, to receive within them the entire circumference of the front and rear edges of the cylinder, for the prevention of the escape of the fire and the protection of the hand from being burnt. The inventor of this improvement is A. J. Gibson, of Worcester, Mass.

FLEXIBLE TUBE JOINT.

The object of this invention is to obtain a very simple, secure and gas-tight flexible joint or connection for gas tubes, one that will admit of a universal movement of suspended tubes to which burners are attached, and the consequent adjusting of the burners in any position most favorable to shed the light properly for the person requiring it. The ordinary single joints admit of the adjustment of the tube in one direction only. Universal joints constructed in the usual way have been employed, but they are attended with considerable expense in construction and liable to leak and get out of order. This invention consists in suspending the pendant burner-tube to the main tube by means of a chain or its equivalent to obtain a secure and flexible connection, and covering the ends of the tubes or their sockets with a tube of india-rubber or other similar substance, to form a gas-tight joint. This device has been patented to Anthony Stratton, of Brooklyn, N. Y.

FURNACES FOR SUGAR BOILING.

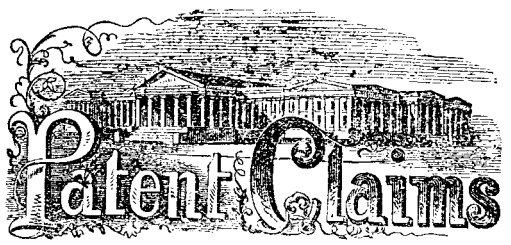
This invention consists in the employment for the purpose of supporting the kettles, of double arches supported partly by the side walls and partly by pillars or piers between the kettles, by which means the canal or flue may be made much wider than when single arches extending all across the canal or flue are used, as in the ordinarily constructed kettle furnace, and to obtain more room for the circulation of the flame and heated gaseous products of combustion at the sides of the kettles and an increased heating effect on those parts. This improvement was designed by John P. Henderson, of Franklin, La.

CARRIAGE TOPS.

This invention consists in a certain novel means for attaching and detaching or shifting carriage tops to the seat rail, whereby the top may be taken off or put on with great ease and facility, and also, so that the attachment may be made rigid and secure. The invention consists in the use of hooks and eyes, and bolts that are peculiarly applied and arranged so that the top may be slipped on to it, and off from it at pleasure. The patentee of this invention is John S. Belcher, of Albany, N. Y.

SKATE.

This invention consists in making the sole plate conform to the shape of the shoe sole, and of one piece of thin steel, and in fixing a runner or skate iron to said plate, having a slip joint immediately behind the ball of the foot. Jeremiah Heath, of Providence, R. I., is the inventor, and the claims was published in our last issue.



ISSUED FROM THE UNITED STATES PATENT OFFICE
FOR THE WEEK ENDING JULY 10, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

29,043.—Allan Agnew, of Chester county, and William Morrison, of Chadd's Ford, Pa., for an Improvement in Cultivators:

We claim a cultivator composed of a stem and branches and teeth projecting from the ends thereof, and secured and made adjustable thereon, as set forth, the whole being constructed and arranged substantially in the manner and for the purposes described and represented.

29,044.—S. M. Andrus, of Bellevue, Mich., for an Apparatus for Protecting Buildings from Fire:

I claim connecting the wad, I, with a tilting and distributing arrangement of water, substantially in the manner as described, so that when an explosion occurs, an alarm will not be given, but water will be discharged almost simultaneously on and around the spot, where the fire first communicated with the fuse.

29,045.—George Arrowsmith, of Lockport, N. Y., for an Improvement in Grain Separators:

I claim the construction and arrangement of the separating chamber, B, consisting of the alternate series of angular dividing partitions, f, and opposing inclined planes, g g, with the blast orifices, h h, and i i, operating in connection with the fan, A, and secondary chambers of separation, D D, substantially as and for the purposes set forth.

29,046.—Samuel Avery, of Pisgah, Mo., for an Improvement in Corn-planters:

I claim the main shaft, operated by gearing, b b', connected with the driving wheels, B B, and the brakes, P, for regulating the motion of said driving wheels, so that the same shall rotate alike, and be under the control of the operator, as and for the purposes set forth.

I also claim the lime boxes, G, mounted on the frame, A, and provided with ratchet wheels, H, said ratchet wheels being operated by means of pawls, j, on each end of a slide bar, I, said slide bar receiving its motion from the main shaft, D, by means of the cams, c, acting on the lever, k, all arranged and operating substantially as shown and described.

[This invention consists in an arrangement of gear wheels operated by the driving wheels which support the machine, and connected with a shaft that transmits motion to the various parts of the machine. These gear wheels serve to regulate the two driving wheels, so that each shall make the same number of revolutions in a given time, thus obviating side draught. It also consists in the application of brakes to the driving wheels in such a manner as to control their revolutions when passing over uneven ground. It further consists in the arrangement of boxes for holding lime or other white substance, which is caused to be deposited at stated periods, in such a manner as to serve as guide marks by which to regulate the machine in its transits across the field.]

29,047.—M. H. Bacon, of Mystic, Conn., for an Improvement in Machines for Dressing Millstones:

I claim, first, The combination of the loose joint, B, reversible wiper, E, and reversible cutter bar, G', or their respective equivalents, on the hinged frame, A C, so that the path of the cutters may be adjusted to all the lines required upon the face of the stone, substantially as described.

Second, I claim operating the hook, M, or its equivalent, by the same motion which graduates the force of the blow or by a continuation of such motion, substantially as set forth.

Third, I claim reversing the position of the wiper, E, and arm, G', substantially as described, to allow of dressing stones which turn in opposite directions.

29,048.—B. O. Ball, of Greensburgh, Ohio, for an Improved Self-heating Smoothing-iron:

I claim, first, The arrangement of the pipes, F F, the wick tubes, a a, the wire conductors, c c, with the partitions, H H, on the body of the iron, the same being used substantially as and for the purpose specified.

Second, The arrangement of the flanged lampstand, the lamp provided with tubes, F F, tubes, a a, and partitions, i i i, the partitions, H H, and the dampers, e, the whole being used substantially in the manner and for the purpose specified.

29,049.—J. S. Belcher, of Albany, N. Y., for an Improvement in Attaching Movable Carriage Tops:

I claim the mode of securing shifting carriage tops to their seats by means of the hooks, F, eyes, E, and the keys or pins G, described, so that the tops can be put on or removed with facility and ease, as set forth.

29,050.—F. H. Bell, of Washington, D. C., for an Improvement in Hat Ventilators:

I claim a new article of manufacture, to wit, a portable hat ventilator, consisting of the narrow spring, i, knobs, m, anti-absorbent network, O, slotted attaching strips, e, and buttons, a, the whole constructed in the manner and for the purpose set forth.

[This invention provides a neat light ventilator for all kinds of hats. It is sold in the stores as an article of manufacture independently of the hat, and can, in a moment, be applied to a straw, felt or silk hat, as may be desired. When applied, it gives a neat finish, and dispenses with the use of a sweat leather, as it is anti-absorbent. The construction is very simple, and the cost is but trifling. Everybody who wants to keep his head cool and his hair in a healthy state ought to purchase one of these ventilators, for they certainly are just the thing needed during this hot weather.]

29,051.—John Bell, of Harlem, N. Y., for an Improved Method of Operating the Cutters in Dovetailing Machines:

I claim the combination of rotating cutters and a tilting table, when one is made to pass the other vertically, in addition to its other movement, substantially as described, the object being to cut dovetails on wood, as stated.

29,052.—Levi Bissell, of North Bergen, N. Y., for an Improved Churn:

I claim the combination and arrangement of the oppositely inclined sets of dasher wings, L L, following each other on their respective shafts, while those of one dasher alternate and intermatch with those of the other dasher, and the intermediate horizontal dasher wings, M M, substantially in the manner and for the purpose specified.

29,053.—C. B. Brinckerhoff, of Batavia, N. Y., for an Improvement in Harvesters:

I claim, first, The peculiar construction, location, and arrangement of the back action rake, the gearing, and the mechanism for connecting them, in combination with the driving wheel, platform, and main frame, substantially as described.

Second, The arrangement of the compound elongating levers, f f, operated by the eccentric on the shaft, B, in combination with the platform and the back-action rake, or its equivalent, in the manner and substantially as described for the purpose specified.

29,054.—A. C. Brown, of Philadelphia, Pa., for an Improvement in Condensers:

I claim the employment of a perforated refrigerating conductor, G, in combination with the discharge-pipe, B, of the still or retort, A, substantially as and for the purpose shown and described.

[This invention facilitates the refrigeration or cooling of the vapor rising from the still of distillatory apparatus of any description, to condense the same whilst passing from the still to the room tub, by keeping the main pipe or that between the worm tub and still as cool as the worm in the tub, as will be fully understood by the above claim.]

29,055.—C. F. Brown, of Warren, R. I., for an Improvement in Wheels for Gun Carriages, &c.:

I claim binding the groove, a, with a shoulder, b, of greater depth than the shoulder, c, which binds the other side of the groove, a, so that a support and guide for the central plate, D, will be provided during the shrinkage of the tire upon the plate, as set forth and described.

[This invention relates to the construction of wheels wholly o wrought iron or of wrought and cast iron combined. It consists in a certain novel, simple, and very secure mode of combining a wrought iron rim with a wrought iron plate which forms its connection with the hub; also, in a certain construction of the hub and mode of combining it with the plate.]

29,056.—Thomas Byrne, of Baton Rouge, La., for an Improved Method of Cooling Water:

I claim the combination of a subterranean reservoir, e, with a feed-pipe, b, and a discharge pipe, a a', when constructed, arranged and operated in the manner and for the purpose set forth.

29,057.—G. W. Clark, of Mount Washington, Ohio, for an Improvement in Seeding Machines:

I claim the combination of the harrow, A, seed-box, C, and drag, F, constructed, combined, and operating in the manner and for the purposes set forth.

29,058.—G. H. Clemens, of Cincinnati, Ohio, for an Improvement in Saw-mills:

I claim, first, The combination of the setting screw, y', clamp nut, w', double eccentric, x', and weighted lever, g2, constructed and operating in connection with the head block of a saw-mill, substantially as and for the purposes set forth.

Second, A joint in a saw-mill dog near its spike end, or at it, substantially as described and for the purposes specified.

Third, The arrangement of two or more head blocks with one end of each upon a single carriage sill, and at their opposite ends, each resting upon an independent truck, substantially as described and for the specified purposes.

Fourth, The combination of the levers m and q, mandrel, c, steady pins, s, and adjustable rod, o p, said parts being constructed and operated in the manner and for the purposes set forth.

Fifth, The combination of the conical feed pulleys, f u, lever, f', and pulleys, b w, and z, constructed and operating in the manner and for the purposes explained.

29,059.—Ebenezer Clemo, of Toronto, C. W., for an Improvement in the Manufacture of Paper Pulp:

I claim the mode or process of treating straw and other fibrous substances in the manufacture of paper stock, substantially as described.

29,060.—Jacob Closs and I. N. Pyle, of Decatur, Ind., for an Improvement in Water Wheels:

We claim the arrangement of the wheels, F D, and their shafts, B, E, in combination with the openings, c c, l l, and gates, m o, as shown and described, so that one or both wheels may be operated as desired—all as set forth.

[This invention relates to an improvement in horizontal water wheels, and consists in combining two wheels in such a manner that both may be used and made to operate conjointly by the action of the same volume of water in passing through both, or one of the wheels used separately, as occasion may require.]

29,061.—Wm. Compton, of New York City, for an Improvement in Bridges for Pianos:

I claim the arrangement of the bars, d g and h, with their flanges, to form up-and-down bearings for the strings at the sounding board bridge, in the manner and for the purposes set forth.

I also claim the arrangement of a series of bars having up-and-down bearings at the wrest plank bridge, in the manner shown, when such bars are separate from the wrest plank plate and attached to the wrest plank so as to be removable in sections, in the manner and for the purposes specified.

And I also claim the perforated bar or box, f or m, when combined with an up-bearing rest, 4 or n, and fitted so as to be removed from, or attached to, the wrest plank, for the purposes set forth.

29,062.—G. W. Corson, of Corson's Post-office, Pa., for an Improved Machine for Sawing Bevels on Laths:

I claim the combination of the oblique saw, C', the adjustable carriage, B, on inclined block, D, with plane saw, C, adjustable guide piece, g, shaft, S, and band, b, operating substantially as and for the purposes set forth.

29,063.—Thomas Courser, of Princeton, Ill., for an Improvement in Machines for Binding Grain:

I claim the knotting apparatus, composed of the several parts specified, when the said parts are constructed and arranged for joint operation in the manner and for the purposes described.

29,064.—J. A. Davis, of Portsmouth, Va., for an Improvement in Lowering and Detaching Ships' Boats:

I claim, first, Constructing a trip hook, for attaching boats to, of three parts, to wit: a hinge, a catch and a ring, when the said parts are combined and arranged, in relation to each other, in the manner and for the purposes described.

Second, The relative arrangement of suspension ropes, a a', trip ropes, b b' and c c', pulleys, d d' d'', and trip hooks, k l m o p, substantially as and for the purposes set forth.

29,065.—Zina Doolittle, of Perry, Ga., for an Improvement in Cotton-seed Planters:

I claim, first, The arrangement and combination of the hinged oscillating hopper, D, vibrating curved fingers, G, and pin wheel, B, constructed and operating substantially in the manner and for the purpose specified.

Second, The combination, with the vibrating curved finger, G, of the curved slotted seed passage-way, F, constructed and operating substantially as and for the purpose set forth.

Third, The arrangement of the thumb screw, m, in combination with the vibrating curved fingers, G, operating substantially in the manner and for the purpose described.

[This invention consists in the arrangement of a pin wheel, in combination with a hinged oscillating hopper and with vibrating curved fingers, in such a manner that, by rotating the wheel, motion

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is imparted to the hopper and to the fingers, whereby the discharge of the seed is facilitated; also, in combining with said vibrating curved fingers a curved slotted seed passage-way, so that the fingers, by entering through the slot in said passage-way, may prevent a clogging-up of the seed as it discharges; also, in the arrangement of a thumb screw, in combination with the above-mentioned oscillating curved fingers, in such a manner that the motion of the fingers can be regulated independent from the motion of the hopper.]

29,066.—F. Elder, of Winnsboro', S. C., for an Improved Mattress and Bed:

I claim the combination and arrangement of the frame, A B, strips, C, with mattress, L, corner notches, E, and false posts, I, substantially as and for the purpose specified.

29,067.—Ezra Emmert, of Franklin Grove, Ill., for an Improvement in Seeding Machines:

I claim the combination, with a seed box, A, of the perforated slide, E, pendants or agitators, d, pitmen, e, inclined guide board, F, plate or apron, G, and harrow, H; all arranged and operating substantially as described.

[This invention consists in the novel arrangement and combination of a seed box mounted on two wheels, and having perforations or seed cells in its bottom and a corresponding perforated slide for contracting said cells so as to regulate the discharge of seed, and of oscillating pendants or agitators for preventing the seed from becoming clogged over the seed cells; said agitators being operated by pitmen connected with crankshafts and crank pins on the wheels, and of a guide board and apron attached to the under part of the seed box to insure an even and undisturbed distribution of the seed, and in connecting a harrow for the purpose of working-in or covering the seed after it has fallen to the ground.]

29,068.—J. U. Fischer, of New York City, for an Improvement in Pianofortes:

I claim, first, The arrangement of the strings in the triangular form specified, for balancing the strain on the metallic plate, as set forth.

Second, I claim the metallic plate, g, and sounding board, m, connected together at the edges of the openings for the hammers by the ribs or strips, 4 4, when the length of string is determined by bridges at each end that rest on the sounding board and pass through openings in said plate, g, as specified.

Third, I claim forming the base or bottom, e, of the piano of the wooden cross-pieces or sills within the wooden surrounding frame, in combination with the metallic plate, f, screwed on to the bottom of the instrument, for the purposes described and shown.

Fourth, I claim the openings, 1 1, in the bottom of the piano, to afford access to the nut, 2, or fastenings for attaching the legs, c c, substantially as specified.

29,069.—John Fitch, of Seneca Falls, N. Y., for an Improvement in Filters:

I claim the filter when constructed, arranged and operated in the manner and for the purposes set forth.

29,070.—Russel Frisbie, of Middletown, Conn., for an Improved Bench Hook:

I claim the cam lever, in combination with the case and bench hook, substantially as described.

29,071.—J. S. Gage, of Dowagiac, Mich., for an Improvement in Seeding Machines:

I claim the combination of the [illegible]rs, B, with the seed boxes, D E, and coverers, J, arranged for [illegible] operation as and for the purpose set forth.

[This invention consists in a novel and improved arrangement of seed-distributing device, rollers and coverers, whereby the seed may be planted and covered, and the ground rolled and left in a better state than hitherto for the growth of the crops.]

29,072.—R. J. Gatling, of Indianapolis, Ind., for an Improved Lath Machine:

I claim, first, The employment or use of the two obliquely reciprocating bars, F G, provided respectively with the bolt, I, and knife, J, and operated substantially as and for the purpose set forth.

Second, The arrangement of the slotted arm, M, rod, O, and adjustable frame, P, substantially as shown, to vary the length of stroke or movement of the bars, F G, for the purpose specified.

[The object of this invention is to obtain a simple and efficient machine for cutting or riving laths from a bolt—one that may be operated by a small expenditure of power, and require no manipulation except the applying of the bolt to the machine. The invention consists in the use of a cutter or knife bar and a bolt bar, attached to eccentrics so arranged, relatively with each other, that the two bars will have an oblique reciprocating movement towards and from each other, and the desired end attained. The invention also consists in a peculiar means of applying the power to the knife and bolt bars, whereby the stroke or length of movement of the same may be varied, as occasion may require.]

29,073.—L. C. Gillespie, of Denmark, Tenn., for an Improvement in Harrows:

I claim a metallic side harrow head, a b d d, open at front and rear, and having a central oblique or diagonal slot, c c, and openings, e e', in combination with a plow beam, substantially as and for the purposes set forth.

[This invention consists in making a harrow head for cotton-scraping plows of metal, in a peculiar manner. The head is made hollow, open at front and rear, and having a diagonal box at its center to admit the beam of the plow. This harrow head possesses great strength, and renders implements to which it is applied very durable and perfect. We think well of the invention.]

29,074.—Henry Glover, of East Douglas, Mass., for an Improvement in Windmills:

I claim the arrangement and combination of the fixed disk, I', with the rotating horizontally-sliding disk, I, arms, k, shafts, G H, sails, J, lever, M, rod, N, sliding collar, P, and rod, R, as and for the purpose shown and described.

[This invention consists in constructing each sail of a number of slats or shutters, which are arranged and connected to springs in such a way that these springs will operate to close them for obtaining the full benefit of the force of wind and in hanging these sails on one end of a hollow shaft, the opposite end of which carries a bevel spur wheel that engages with a similar wheel on a vertical spindle that transmits the power to machinery to be operated by the windmill; and through said hollow shaft is passed a solid shaft that operates the shutters of the sails simultaneously by ropes or chains that are wound upon the end of this shaft, where an arrangement of clutches are arranged to operate upon it by a lever and connecting rod that is carried down into the mill-house, so as to be convenient to the attachment; and when the clutches are disengaged a spring, suitably connected with the hollow and fixed shafts, will return the shaft back to its former position and allow the shutters to close.]

29,075.—H. R. Hawkins, of Akron, Ohio, for an Improvement in Hay Racks for Carts:

I claim a removable folding hay rack for carts or wagons, constructed and operating substantially as set forth.

29,076.—J. P. Henderson, of Franklin, La., for an Improvement in the Arrangement of Sugar Kettle Trains:

I claim a range of kettles on double arches, B B, supported partly upon center pins or pillars, C C, between the kettles, substantially as and for the purpose specified.

29,077.—Daniel Hess, of West Union, Iowa, for an Improved Carpet-sweeper:

I claim, first, The arrangement of the bellows, D, with the water chambers, F F, and the brush, C; the same being used and made to operate substantially as and for the purpose specified.

Second, The arrangement of the pipes, c c b b d d and G, with the bellows, D, brush, C, and water chambers, F F, whereby dust is drawn into the machine and submerged in water, substantially as specified.

29,078.—George Hetrick, of Reidsburg, Pa., for an Improvement in Seed Planters:

I claim the arrangement of the standards, D D, axle, B, wheels, A, with spikes, C C', and caster wheel, O; the whole being constructed and arranged for joint operation substantially as described.

29,079.—Enoch Hidden, of New York City, for Improved Side Lights for Ships:

I claim the employment, on a hinged or swinging ship's light, of a spring catch bar, in combination with a locking screw or its equivalent; the two arranged to operate substantially as described, for the purposes set forth.

29,080.—B. B. Hotchkiss, of Sharon, Conn., for an Improvement in Cartridges:

I claim, first, The compound cartridge case, A B, composed of metal and cloth or other soft material, combined substantially in the manner described, so as to be removed from the gun by the explosion of the powder, and also to sponge the gun in its passage through the bore, substantially as specified.

Second, A metallic cartridge case, with a strong front end and a weak back, for the purpose of causing it to be blown out of the gun by the explosion of the charge.

Third, Radially dividing the metal of the back end of the cartridge case and joining it by weak solder, substantially as and for the purpose described.

Fourth, The block, D, of wood or other suitable material, in the forward end of the cartridge, for the purpose of strengthening the end of the case, A, and giving momentum to the structure, substantially as described.

Fifth, Extending the covering, D, over the front end of the case, A, substantially as and for the purpose set forth.

29,081.—G. H. Hulskamp, of Troy, N. Y., for an Improvement in Pianofortes:

I claim, first, The use of a strained sounding-board in pianofortes, whether made of wood, metal or other material, substantially as described.

Second, I claim the same when made to counteract the tension of the strings, substantially as described.

Third, I claim the oblique sounding-posts or braces, or the continuous curved sounding-bridge or board, where by the vibrations of the strings are transmitted to near the middle part of the sounding-board, substantially as described.

Fourth, I claim the extension of a wooden hitch board, made thick with different pieces of wood, as described, nearly to the sounding-board bridge, in combination either with a sounding-board bridge (the frame extending no further than the sounding-board bridge) or a sounding-board below the frame, or both, for the uses and purposes set forth.

Fifth, I claim the mode set forth of strengthening the pianoforte by making the iron brackets, K K K K, bear not only against the iron plate on the upper side, but also against an iron plate through intermediate bars on the underside, and connecting that iron plate with the top plate by the iron bolts, J J, substantially as described.

Sixth, I claim the construction of the bridge, L, and the agrafe (Fig. 4), substantially as described, or making the bridge, L, of soft metal, in the manner as the agrafes.

29,082.—A. R. Hurst, of Chambersburg, Pa., an Improvement in Horse Hay Rakes:

I claim, first, Providing each of the rake teeth, h e, with an adjustable weight, k, substantially as and for the purposes set forth.

Second, Combining two levers, d o, with a lever, d, and a ratchet bar, c, for the purpose of operating the rake teeth, h e, substantially as set forth.

Third, Making the weights, k, adjustable by hinging them to one of the bearers, d, substantially as and for the purposes set forth.

Fourth, So arranging and combining the bearers, d o, rake teeth, h e, and weights, k, that one lever answers for regulating the weight upon each rake tooth and for elevating the rake teeth above the ground, as set forth.

29,083.—Benjamin Irving, of New York City, for an Improvement in Syringes:

I claim, as an improved article of manufacture, a syringe, for the cure of internal hemorrhoids, that is provided with an enlargement, B, for the reception of the ointment, a screw plunger, C, to fit said enlargement, a holding wire, D, and discharge tube, A; the whole constructed as shown and described.

[This invention consists in constructing a perforated tube with an enlargement on one end having a cavity of sufficient capacity to contain the desired quantity of ointment, into which enlargement is screw-tapped a plunger with a milled head, for forcing the ointment out through the perforations in the tube. A small handle is furnished to the syringe for holding it firmly while the plunger is operated.]

29,084.—B. A. Jenkins, of Whitewater, Wis., for an Improvement in Harvesters:

I claim, first, A toothed rake arm, a, pivoted at one end and actuated by two springs, j k, cord, m, and lever, n', so as to move in an arc of a circle in a plane parallel to a platform, and also to turn on its own axis, in combination with a spring plate, c, forked deflectors, h h', slotted platform, g, and cutters, i i', in the manner and for the purpose described.

Second, Arms, m', pivoted at the lower end, in combination with stirrups, l', supporters, k', cord, v, pulleys, r' r', perforated crank-shaft, S, and ratchet, u, for the purpose of operating the two arms, m', simultaneously, and thereby to elevate or depress the reel, in the manner and for the purpose described.

Third, The arrangement of the reel-supporting bar, k', so that its fulcrum is behind the driving wheels, and always in line with the center of the pulleys, c' d', in combination with the pivoted arm, m', in the manner and for the purpose set forth.

[By the first feature of this invention, the grain or corn is raked regularly and perfectly from the platform. By the second feature, the reel can readily and easily be adjusted to suit grain or maize of different hights by the driver while he sits upon his seat; and by the third feature, the belt gearing of the machine is always kept taut, no matter how high or low the reel may be set. This harvester is quite ingenious in its arrangements, and can, with safety, be pronounced a good improvement.]

29,085.—C. E. Ketchum and W. L. Hunt, of Port Jefferson, N. Y., for an Improvement in the Construction of Center-board Vessels:

We claim the keelson log, J, introduced between the keel and keelson, substantially in the manner and for the purposes set forth.

[This invention consists in interposing a solid timber, termed the "keelson log filling," between the keel and keelson, so as to completely fill up the space usually left between these two timbers; said keelson filling being seated on the keel in such a way that the caulking can be done from the outside of the vessel, before both sides of the outer planking are put on.]

29,086.—J. K. Lewis, of Rising Sun, Ind., for an Improvement in Supporting Scaffolds:

I claim elbow-jointed reversible extension brackets for sustaining staging of scaffolding on two or more ordinary ladders, as set forth in the above specification.

29,087.—J. B. Livezey, of Clarksboro', N. [illegible], for an Improvement in Cultivators:

I claim the arrangement of the sliding cross-head, D, pivoted links, E, and hand lever, F, in combination with the side wings, C, and beam, A, constructed and operated substantially as and for the purpose specified.

[This invention consists in the arrangement, in combination with the sidewings, of a sliding head operated with a hand lever, and fastened to both wings in front, together with two pivoted locks, which connect the rear parts of said wings to the beam in such a manner that said wings, on being expanded or contracted, receive at the same time a longitudinal sliding motion.]

29,088.—J. R. Lounsberry, of New England Village, Mass., for an Improvement in Hooks for Watch Chains:

I claim the jointed bow, d, with its tongue, g, and the slotted portion, h, for locking the end of the bow to the stem, substantially as and for the purpose specified.

[This invention consists in the employment of a jointed elliptical ring, or two elliptical bows jointed together in a suitable manner, one of which is securely attached to the end of a hollow stem while the end of the other is attached to the hollow stem by a T-head pin and movable slotted tube that works within the stem, said tube being rotated by a thumb ring so that the movable jointed bow may be opened and passed through a button hole, and then closed and secured fast by a simple turn of the thumb ring.]

29,089.—W. N. Manning, of Salem, Mass., for an Improved Planing Machine:

I claim the combination of the rotary cutters, c, and rotating disk, G, arranged to operate as and for the purpose set forth.

[This invention relates to an improvement in that class of wood-planing machines in which a rotary cutter-head is used, the cutters being fitted in a circular disk, as, for instance, in the Daniels' machine. The object of this invention is to produce a smoother cut than has been hitherto done by the class of machines aforesaid, and at the same time perform the work equally as rapid.]

28,090.—J. W. Masury, of New York City, for an Improved Paint Can:

I claim the combination in the mannner shown and described, with the wooden cover, B, and the head of the can, A, of the hook-shaped straps, C, for the purpose set forth.

[This invention consists in combining with a can for putting up paints, or other substances, a solid cover of wood, or any other suitable material, projecting a little distance into the interior of the can so as to strengthen the edge of the same and to prevent it collapsing when exposed to a heavy pressure or to a strong concussion; and it consists further in combining with said solid cover two or more straps, secured by screws to the cover, which, by catching under the bead on the top edge of the can, serve to retain the cover and to prevent it coming off spontaneously, and which are so arranged that they can be taken off and put on without injuring any part of the can.]

29,091.—S. H. Mix, of Schoharie, N. Y., for an Improved Process of Making Stereotype Plates:

I claim the use of foil of tin, or other metal, upon the face of the type form to be stereotyped, and interposed between it and the matrix or mold for the stereotype plate, in the manner and for the purposes described.

29,092.—N. Q. Munger, of Brookfield Center, Wis., for an Improvement in Aesophagus Tubes:

I claim an instrument for the relief of choke and bloat, having a hollow tube, A, with a flaring mouthpiece, b, and with an egg-shaped perforated bulb, c, constructed and operating substantially as and for the purpose described.

[This invention consists in the employment of a hollow flexible tube closed at one end, and provided with a series of perforations near to the closed end, for the purpose of relieving cattle of choke and bloat.]

29,093.—Richard Murdoch, of Baltimore, Md., for an Improvement in the Running Gear of Vehicles:

I claim, first, The combination of the curved braces, F F, with the bed, C, and plates, H H', substantially in the manner and for the purpose described.

Second, The combination with the bolt, n, of the slide piece working in the slot, o, in the manner and for the purpose specified.

29,094.—Harrison Ogborn, of Greenfork, Ind., for an Improvement in Cultivators:

I claim the arrangement of the spring bolts, K K, the piece, H, staple B, and movable seat, M, in combination with the plows, U U and V W, the whole being arranged, constructed and operated substantially as set forth.

29,095.—S. E. Oviatt, of Richfield, Ohio, for an Improvement in Threshing Machines:

I claim the arrangement of the pipes, C C' and F, and flue, H, in combination with the revolving screen, J, and valve, P, substantially in the manner and applied to the purposes described.

29,096.—W. H. Paine, of Sheboygan, Wis., for an Improved Surveyor's Tackle Case:

I claim the surveyor's measuring tackle case, constructed of any suitable material, essentially in the manner and for the purposes set forth.

29,097.—G. M. Phelps, of Troy, N. Y., for an Improvement in Pendulum Clocks:

I claim so mounting two vibrative pallets upon the pendulum of a timekeeper that, in the oscillations of the pendulum, the axis on center of vibration of each pallet will be carried to, nearly to or past a line drawn from the axis or center of oscillation of the pendulum, through the point where the swing-wheel bears on the pallet, substantially as set forth.

29,098.—Nathaniel Potter, Jr., of South Dartmouth, Mass., for an Improvement in Apparatus for Protecting Trees from Insects:

I claim, first, The flange, g, on the trough, A, substantially as described, for the purpose specified.

Second, I claim the combination with the hood, D, and trough, A, the lamp, E, and reflector, G, arranged and operating substantially in the manner and for the purpose specified.

29,099.—J. H. Power, of Middletown, Iowa, for an Improved Broom or Brush:

I claim the arrangement of the brush fibers or broom corn between the screw of the handle and the inner surface of the hollow head, as shown and described, so that the said fibers will, by the pressure consequent upon introducing the screw into and among the said fibers, cause the latter to press into and fill the threads of the screw, and thus hold the handle firmly to the broom or brush, all as set forth.

[The object of this invention is to obtain a simple and efficient manner of connecting the handle to the broom or brush, whereby

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not only a firm and permanent connection is obtained, but the constructing or manufacturing of the broom or brush is greatly facilitated. The invention consists in the employment or use of a metallic head, fitted on the end of the broom corn or bristles, and a taper screw formed on the end of the handle and screwed into the corn or bristles within the metallic head.]

29,100.—John Price, of Harrison, Ohio, for an Improvement in Corn Planters:

I claim, first, The arrangement of the hinged frames, E and F, in combination with the main frame, the levers, K and L, the shovels, G, the coverers, H, and rollers, I, the whole being arranged and operated substantially as set forth for the purposes described.

I also claim the combination of the bar, U, cams, V, spring, Z, arms, T, shaft, S, and seed cup, n, arranged substantially as set forth for the purposes specified.

29,101.—G. M. Ramsay, of New York City, for an Improved Machine for Sweeping Streets:

I claim the manner of attaching and detaching the frame, e, brushes, g and k, pinion, h, and apron, J, to and from the axle, d.

I also claim the revolving dirt box, c, when in combination with frame, e, and its appurtenances, as described.

29,102.—Edwin Ritson, of Sanbornton Bridge, N. H., for an Improvement in Seeding Machines:

I claim the combination of caster-wheel, C, wheels, g, and the seeding arrangement with rotary harrow and roller, B, all arranged relatively with each other to effect the objects, in the manner set forth.

[This invention combines in one machine, in a novel manner, the operation of forming ridges in the surface of the soil for receiving the seed, sowing the wheat and harrrowing and rolling the same.]

29,103.—Milton Roberts, of Worcester, Mass., for an Improved Lathe.

I claim arranging one or more shaping or molding tools in one piece, or in parts, on an oblique bar in a reciprocating gate which moves transversely of, and at right angles with the piece to be turned, in the manner and for the purpose specified.

I also claim, in combination with the middle chuck, two reciprocating gates, in the manner and for the purpose set forth.

I also claim the application of the hollow universal chuck, or its equivalent, in the manner and for the purpose set forth.

29,104.—H. H. Robertson, of Kingston, Mo., for an Improvement in Plows:

I claim the arrangement of a hinged plow, F, carriage, A A′ B, vertical adjusting screw, d, segment guide frames, E, toothed segmental adjusting bars, i j, cog pinion, k, pawl, o, or stop, m, substantially as and for the purposes set forth.

[This invention consists in arranging a series of plows attached to beams on a wheel carriage, so that they may be moved further apart, up and down, or in any manner desired, while the driver sits on the seat of the carriage. This is a good arrangement.]

29,105.—Wm. Schnebly and Thos. Schnebly, of Hackensack, N. J., for an Improvement in Horse Rakes:

We claim the arrangement of the axis bar, d, of the swinging frame, E, between the axis of the wheel, B B, and the traverse bar, d, as shown and described, so that the rear ends of the bars, b b, will be supported against the inward pressure of the wheels, all as set forth.

We also claim the arrangment of the wheels, B B, and their axis upon the extremities of the said bars, b b which carry the swinging frame, whereby the employment of an axle tree, extending from wheel to wheel, is avoided, and the inside of the frame is left entirely open for the unobstructed operations of the rake, all as represented and described.

[This invention consists in attaching a double rigid-toothed revolving rake to a carriage by means of a swinging frame, arranged relatively with the carriage and its line of draught, in such a manner that the rake may be readily adjusted from a working to an inoperative position, and vice versa, and also, by a very simple manipulation, permitted to readily rotate or partially rotate and discharge its load, the rake at the same time having a tendency to retain itself in a proper working posltion, effectually opposing casual rotation and all undue strain from any resistance offered to it by its work, and obstacles which may lie in its path. The invention also consists in the employment or use of adjustable shoes applied to the rake-head and arranged in such a way as to regulate its action or adjust the rake to a greater or less hight, as circumstances may require.]

29,106.—Francis Schwalm, of Joliet, Ill., for an Improvement in Stone-dressing Machines:

I claim the employment or use of the sliding eccentric, I, connected with the chisel-bar, K, and arranged to operate as and for the purpose set forth.

I also claim, in connection with the eccentric, I, and chisel-bar, K, the adjustable guide bar, Q, for the purpose specified.

[This invention consists in the employment or use of a sliding eccentric, connected with a band in which a series of chisels are fitted; the chisels being provided with a rack, and all the working parts being fitted in sliding frames so arranged as to admit of the perfect adjustment of the chisels and a proper adaptation to their work under all circumstances.]

29,107.—Frederick Seidle and Samuel Eberly, of Mechanicsburgh, Pa., for an Improved Machine for Bending Wood:

We claim, first, The combination of a revolving yielding pressure pattern with an unyielding sliding bed, arranged substantially as described, for the purpose set forth.

Second, Attaching the pattern to the frame, substantially as described, so that it can be removed by simply drawing it out without unloosing any bolts.

29,108.—Christian Sharps, of Philadelphia, Pa., for an Improvement in Packing Cartridges:

I claim the process of packing the hollow collars of metallic cartridges with detonating powder, by means of a wad, d, of a form substantially as specified, and applied substantially in the manner and for the purpose set forth.

29,109.—J. T. Smith, of Portsmouth, Va., for an Improvement in Cranes:

I claim the brace, E, attached to the upright beam or mast, C, and provided with the wheel, F, which runs on or against the annular way, G, on the platform, A, in connection with the rollers, b b, on the cross-bar, H, bearing against the under side of the platform, A, substantially as and for the purpose set forth.

[The object of this invention is to steady and support the upright beam or mast of the crane, so that the same will not be liable to break as hitherto under the weight of the loads which it is hoisting. The invention consists in the employment or use of a diagonal brace, provided with a wheel which runs on or against an annular way on a platform of the crane, in connection with wheels attached to a horizontal arm of the mast below the platform, and which wheels run in contact with the under side of the mast.]

29,110.—J. A. & J. Smith, of Philadelphia, Pa., for an Improvement in Pumps:

I claim the emptoyment of the spherical shell, A, in combination with the rounded partition, E E′, and rounded piston, H, as and for the purpose shown and described.

[The object of this invention is to economize in the construction of the force pump, and also to dispense with much friction attending the operation of the same. The invention consists in having the body or chamber of the pump constructed in the form of a hollow sphere, provided with inclined partitions, and a vibratory plunger or piston, which, as well as the partitions, is provided with valves.]

29,111.—Wm. Stephenson, of Galion, Ohio, for an Improvement in Gas Pipes:

I claim a wooden gas pipe, A, coated on the inside with a composition of graphite and sulphur, or its equivalents.

29,112.—E. G. Stevens, of Biddeford, Maine, for an Improvement in Syringes:

I claim, first, A sheath or retainer, having a lip or flange so as to embrace and compress the external parts with which it comes in contact, said lip being on its periphery and curved upward, and its internal parts, l, so shaped as to fit when pressed between the labiae, and also to penetrate the vagina; said sheath being also fitted with a valve, or its equivalent, and said sheath being used either above or in combination with a syringe of any description.

Second, I claim the tank, a a, plunger, b, tubes, i and f, spring, x, and spring, e, when combined and arranged substantially as and for the purposes specified.

29,113.—Anthony Stratton, of Brooklyn, N. Y., for an Improvement in Flexible Joints for Gas Tubes:

I claim the chain, C, or its equivalent, in connection with the India-rubber or other flexible tube, D, applied to the sockets, A B, substantially as and for the purpose set forth.

29,114.—S. P. Tolman and N. F. Blodget, of North Orange, Mass., for an Improvement in Tweers:

We claim the improved tweer as constructed with a valve opening, h, and valve, k, arranged on or applied to the air case, so that the said valve shall not only close upon the opening by the force of the blast from the induction pipe, but on cessation of the blast move away from such opening and permit air to enter the case and pass from thence into the mass of fuel.

29,115.—J. J. Unbehagen, of Baton Rouge, La., for an Improvement in Apparatuses for Draining Sugar:

I claim, first, The combination of a cooler, C, with an air-tight hinged case, B, constructed and operating substantially in the manner and for the purpose specified.

Second, Arranging the cooler, C, with double walls, viz., the perforated inner wall, c, and the air-tight inclosure, f, constructed and operating substantially in the manner and for the purpose described.

Third, The arrangement of the perforated conical tube, D, in combination with the cooler, C, substantially as and for the purpose set forth.

[This invention consists in arranging a cooler in combination with an air-tight hinged case, in such a manner that it can be brought in a horizontal position when used for cooling, and in a vertical position when used for draining; also in arranging the cooler with double walls, the inner stationary walls to consist of perforated sheet metal and the outer movable walls to be arranged so as to form an air-tight inclosure around the perforated inner walls as long as the liquid is subjected to the cooling process, and which can readily be removed if the draining operation is to commence; also in combining with the cooler a perforated conical central tube for the purpose of facilitating the draining operation.]

29,116.—Leonard White and I. J. White, of Buffalo, N. Y., for an Improvement in Skates:

We claim the hook, G, projecting from the stud, F, of a skeleton-skate runner, in combination with the screw lock, H, for the purposes and substantially as set forth.

29,117.—S. B. Wilkins, of Milton, Pa., for an Improved Spoke Machine:

I claim the arrangement of the rocking clamp, consisting of the lever shaft, E, lever, F, and the adjustable plate, I, operating as set forth and for the purposes described.

29,118.—T. F. Woodward, of South Reading, Mass., for an Improved Signal Lantern:

I claim, first, The portable signal apparatus for vessels, substantia ly as described, the same consisting of a lantern, or its equivalent, for producing a constant light, with which is combined an apparatus for instantaneously producing a report, or an alarm, and an intense pyrotechnic light, as set forth.

Second, In combination with the igniting and discharging apparatus, the cover, n n, so operated as to be instantaneously thrown open when the contents of the barrels are ignited, and serving to protect the same from exposure to dampness, &c., as set forth.

29,119.—J. M. Bowman (assignor to Huntley, Bowman & Company), of Brockport, N. Y., for an Improvement in Harvesting Machines:

I claim, first, A cutter-bar with acute angular notches on the back thereof for the purpose and substantially as described.

Second, The finger-beam and guard fingers when constructed, connected and operating in combination in the manner and for the purposes specified.

Third, The cutter-bar with its acute angular notches on the back thereof, in combination with the projections on the shank of the guard finger, made and operating substantially as described.

Fourth, The second or dumping platform, a, in combination with the mechanism for operating it and with the first platform, constructed and arranged in the manner and for the purpose substantially as described.

29,120.—C. E. Brown (assignor to himself and Josiah Baxlies), of Bridgeport, Conn., for an Improved Lock:

I claim the combination of the sliding cam, B, with the beveled end of the latch, C, in such a manner that the latch is raised and the door or window opened by the continuation of the same motion or impulse.

29,121.—John Contrell (assignor to himself and Joseph Contrell), of New York City, for an Improved Washing Machine:

I claim the employment of the rack sectors, J J′, and intermediate oscillating pinion, K, gearing with both of said sectors, in combination with the oscillating rubbing tub, B, and conical rubber, D, as and for the purposes shown and described.

[This invention consists in arranging within a slightly-conical tub an upright conical rubber, the surface of which is parallel or concentric throughout with the inner surface of the tub into which it is placed, and in operating the same by the interposition of a pinion spur wheel placed between two racked sectors, one on the top of the tub and the other on the top of the cone, thus obtaining an alternate right and left motion. The rubbing surfaces are furnished with suitable rubbing slats or corrugations.]

29,122.—John Sperry (assignor to himself and C. W. Sherwood), of New York City, for an Improved Tool for Enameling Picture Frames, &c.:

I claim a cylindrical roller having the form of the surface to be enameled made in bas-relief around its circumference substantially in the manner and for the purposes set forth.

[This invention is intended for spreading the enameling composition on wood moldings for picture frames, &c., so as to obtain a smooth and even surface for gilding. It consists in the employment of cylindrical rollers constructed and shaped with reference to the size and shape of the moldings they are intended to be used upon; said rollers having wide flanches projecting from each end that keep them in place in their movement over the molding, and also handles by which they are rolled and controlled.]

29,123.—S. A. Corser (assignor to himself and J. A. Nims), of Northampton, Mass., for an Improvement in Molds for Casting:

I claim the employment of a mold carriage that moves in a circle, in combination with the compression plungers, L M, substantially as and for the purpose shown and described.

I also claim the employment, in combination with the flasks, N Q, of pistons, L M, that have their faces shaped to correspond with the form of the article to be molded, so that the compression of the sand within the flask will be equal in every part as set forth.

I also claim the employment of the supplemental molds, P P, in combination with the pistons, L M, and flasks, N Q, as and for the purposes shown and described.

[The object of this invention is to facilitate the forming of sand molds for casting, and at the same time render the same better than those which are formed manually, by having the sand pressed compactly around the pattern at all points, and enabling the pressure to be varied at certain points as may be required in order to obtain perfect castings.]

29,124.—Erastus Crooker (assignor to himself and J. T. Upson), of Buffalo, N. Y., for an Improvement in Vapor Lamps:

I claim the arrangement of the fluid pipe, K, converging chambers, d and e, screw tops, f and g, recess, f′, and gas pipe, h, as and for the purposes set forth.

29,125.—H. H. Evarts (assignor to himself and P. E. Merrihew), of Chicago, Ill., for an Improved Machine for Sawing Staves:

I claim the combination of the vibrating and reciprocating carriage with the circular saw as described and for the purposes set forth in the specification.

29,126.—A. J. Gibson (assignor to himself and J. P. Hale), of Worcester, Mass., for an Improvement in Revolving Fire-arms:

I claim so applying a so-constructed cylinder, in combination with a so-constructed frame, that when the frame is opened the cylinder remains attached to and swings with the front part of the frame and the barrel, substantially as and for the purpose specified.

And I also claim the construction of the hinge-jointed cylinder frame with chambers in its front and rear ends, to receive and cover the front edges of the cylinder substantially as and for the purpose specified.

Also the recess or chamber, k, in the front or forward end of the cylinder.

29,127.—Joseph Hinman, of Watertown, Mass. and J. S. French, of Marietta, Ga., assignors to themselves and Nathan King, of Middlesex, Mass., for an Improvement in Cotton Cultivators:

We claim, first, The employment or use of a series of plates, B, provided with cutters, C, and attached to a frame, A, substantially as shown for the purpose set forth.

Second, Attaching the cutters, C, to the plates, B, by means of tangs, h, secured by set screws in semicircular bars, g, on the plates directly over slots, f, therein, as and for the purpose specified.

29,128.—Charles Kinzler (assignor to himself and J. H. Voss), of New York City, for an Improvement in Apparatuses for Washing Bone Black:

I claim, first, The arrangement and construction of a triangular box turning on its axis for the purpose of washing animal coal, when said box is provided with internal flanches forming a spiral screw in the manner substantially as specified.

Second, The general construction, combination and arrangement of the washing machine as shown and described, so as to operate substantially in the manner and for the purpose set forth.

29,129.—J. H. Rible, of Somerset, Ohio, assignor to J. W. Bope, of St. Louis, Mo., for an Improvement in Harvesting Machines:

I claim, first, In combination with the main frame and gearing for operating the cutter and reel, the elevating and dumping platform—the parts being arranged and operating in the manner and for the purposes specified.

Second, The combination of the mechanism for binding, elevating and dumping the shock substantially as described.

Third, The revolving platform, K, in combination with the cutting apparatus and elevating mechanism, constructed, arranged and operated in the manner described for the purposes specified.

29,130.—J. C. Cooke (assignor to himself and D. C. Sage), of Middletown, Conn., for an Improved Machine for Cutting Files:

I claim, first, The attachment of the chisel stock at two points to two vibrating rods, G G, by which it is made to receive a movement of a character substantially as specified for the purpose of throwing up the cut.

Second, Providing for shifting the two fixed centers, d d, on which the vibrating rods, G G, work, for the purpose of giving the chisel a greater or less degree of horizontal movement by means of a movable plate, N, or its equivalent, so applied as to provide for the raising and lowering of said centers.

Third, The construction of the chisel stock of two parts, F F′, one of which is capable of a rolling or oscillating movement substantially as and for the purpose specified.

Fourth, Providing for controlling the force applied to the chisel so that it shall be always in proportion to the varying width of a file blank, by means of a compound cam, K l, applied and governed substantially as described to give a greater or less lift to the chisel or hammer, according as the width is greater or less at the part presented to the chisel.

Fifth, The combination of the single chisel-edged dog, r, applied to the point of the blank, and the double or grooved chisel-edged dog, S, applied to the heel of the blank, substantially as specified.

Sixth, The employment, for holding down the file blank at the time of the operation of the chisel, of a presser which possesses sufficient elasticity in a proper direction to enable it to adapt itself to the varying thickness of the blank and to blanks of different thicknesses, and which is raised from the blank before, and kept raised during the feeding operation, substantially as set forth.

Seventh, Making the guide or guides for the file carriage, D, adjustable around the axis of a feed pinion gearing with a rack formed upon or attached to the said carriage substantially as and for the purpose specified.

Eighth, So combining a clutch lever by which the driving pulley or gear may be uncoupled from the main shaft of the machine, with an adjustable wedge attached to the file carriage, substantially as described, that the said wedge may be made to act upon the said lever to uncouple the pulley or gear at such point in the movement of the carriage as may be desired.

29,131.—G. W. N. Yost, of Cincinnati, Ohio, assignor to G. W. N. Yost & Company, of Yellow Springs, Ohio, for an Improvement in Harvesters of Corn and Sugar Cane:

I claim, first, The combination of the knife, B, with its supporter, A, when arranged in relation to each other and to the side of the main frame as described, whereby the opening, f, is provided at the heel of the knife in the manner and for the purpose specified.

Second, The combination and arrangement of the knife, B, drum, E, and arms, D, guards, F, endless chains, J, and inclined platform, I—the whole operating substantially as described, for the purpose of cutting corn stalks or cane and carrying the same to the rear of the machine when cut.

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RE-ISSUES.

W. M. Arnall, of Sperryville, Va., for an Improvement in Grain Separators and Cleaners. Patented May 1, 1860:

I claim, first, The combination of the distributing and equalizing cylinder, I, with the separating cylinders, D and E; the same being used as and for the purpose specified.

Second, The arrangement of the cylinder, I, and adjusting spring, N, or their equivalents, with the cylinders, D and E, and with the brush, F, when the same are used substantially as and for the purpose specified.

A. E. Bonham, of Elizabethtown, Ohio, Administrator of the estate of J. H. Bonham (deceased), late of the same place, for an Improvement in Seeding Machines. Patented December 8, 1857:

I claim a revolving, peripheral seed-discharger having its axis in a horizontal position and in a line with the forward motion of the machine, or in a position suitably approximating thereto.

I also claim adjusting the said seed-discharger to different positions approximating to said horizontal and line-of-motion position.

In combination with a revolving, peripheral seed-discharger having its axis placed as above specified, I also claim adjusting or regulating the quantity of seed discharged through the said seed-discharger.

I also claim the conducting spout, L, in combination with the stopper block, g, and tilting pins, n n, arranged and operating substantially as and for the purpose specified.

N. G. Norcross, of Lowell, Mass., for an Improvement in Circular Sawmills. Patented Jan. 15, 1850:

I claim, first, The application to circular saw frames of rocker boxes and a swing frame, for the purpose of affording end play to the arbor, as set forth.

Second, The application of a re-acting agent to the central part of a circular saw through the medium of the mandrel or by any other substantially equivalent means, for the purpose of restoring the saw to line after it has been deflected.

Third, Suspending a circular saw frame in position and restoring it to line by means of the driving belt arranged and operating substantially as set forth.

W. H. Seymour, of Brockport, N. Y., assignor to himself, D. S. Morgan, A. Palmer, of the same place, and S. G. Williams, of Janesville, Wis., for an Improvement in Reaping Machines. Patented July 8, 1851:

I claim, first, Supporting the arm or lever of a vibrating sweep rake at each end, substantially as described.

Second, Operating an automatic sweep rake by gearing on both ends thereof, in combination with the platform of the harvesting machine, for delivering the grain in gavels, substantially as described.

W. H. Seymour, of Brockport, N. Y., assignor to himself, D. S. Morgan, A. Palmer, of the same place, and S. G. Williams, of Janesville, Wis., for an Improvement in Reaping Machines. Patented July 8, 1851:

I claim the combination of the arm, rod or lever which carries a vibrating sweep rake in combination with a guide rod which forms a movable fulcrum for the rake head, substantially as described for the purpose set forth.

W. H. Seymour, of Brockport, N. Y., assignor to himself, D. S Morgan, A. Palmer, of the same place, and S. G. Williams, of Janesville, Wis., for an Improvement in Reaping Machines. Patented July 8, 1851:

I claim the arrangement of a quadrant-shaped platform immediately behind the cutting apparatus, so as to receive the cut grain as it falls, and from which it is discharged in the arc of a circle substantially as described.

Charles Van De Mark, of Oaks Corners, N. Y., for an Improved Method of Uniting the Panels of Portable Fences. Patented June 2, 1857:

I claim forming or providing the ends of the panels or sections of a fence with hooks and eyes, substantially as specified, to receive each other respectively in succession and thereby to sustain and lock the said panels or sections together in the manner and for the purposes set forth.

Notes and Queries

CORRESPONDENTS sending communications for publication in our columns are requested to avoid writing on both sides of a sheet of paper. This fault, though common to persons unaccustomed to writing for the press, gives great trouble to the printer (especially in long articles), and, when combined with illegibility of handwriting, often causes interesting contributions to be regretfully consigned to our waste-paper basket.

C. H. M., of N. H.—The best coating that we can recommend for iron hoops to prevent them from rusting, is black asphaltum or copal varnish. It should be put on as hot as possible and allowed to dry perfectly before the hoops are used.

E. G. M., of Pa.—Make the stem or handle one inch thick and four inches long, and give to each of the balls a diameter of 7¾ inches, and your dumb-bell, when cast of iron, will weigh 112 lbs.

B. H. N., of Mass.—The explosive matter of torpedoes is fulminating silver. This substance, while wet, is mixed with sand or pounded glass and wrapped in tissue paper. Torpedoes might be made larger than they usually are. Fulminating silver is one of the most dangerously explosive substances known; none but experienced chemists should meddle with it.

S. R., of Pa.—Any metal which is smooth is suitable for molds for plaster-of-paris. The surface should be oiled before use.

W. F., of N. Y.—Tin roofs need to be kept well painted. The fact that you use the rain water from the roof for culinary purposes should not delay the painting. Use good linseed oil and ocher. Until the paint is quite dry, the water should be filtered through fresh charcoal to free it from all odor or bad taste. Whether the tin is painted or not has little to do with the necessity of a lightning-rod. A lightning-conductor of hoop iron would be better than none at all, and, for the same weight of metal, might be more efficient than a rod; but the same amount of surface would be preferable in a rod. The thin edges of hoop iron, acting like a point, would favor a lateral discharge,

W. H. Y., of N. Y.—The diagram of your alleged improvement (conveyed to us by your brother) presents much novelty; but we think it lacks practical utility. We are acquainted with those who have spent a great deal in experimenting to perfect a mode of accomplishing the results which you have imperfectly attained. A gentleman of much scientific ability, residing in your city, has, we understand, devoted nearly his whole time latterly to experiments of this kind. In practice, we think you will find a horizontal movement far preferable to a vertical action. In either case, there must be danger of the piston or plunger becoming excessively heated, notwithstanding a proper use of lubrication. Inform us as to your success as you progress. Such subjects not only interest ourselves, but a majority of our readers.

E. M., of Conn.—The solder which you have sent us appears to be the kind that is employed for brass work, and which is made as follows:—Take 8 ounces of copper and 1 of zinc, and melt the former in a crucible; while doing so, heat the zinc in another crucible up to about 212°, and then add it to the copper and put on the lid. Now shake the crucible for about five minutes and pour out the molten alloy through the twigs of a birch broom into water, when it will be divided into grains and made fit for soldering.

J. R. M., of Maine.—You are quite right about the supposed difference of temperature in the ends of an egg being caused by the air sack at one end, which is a non-conductor. We do not believe that the waters of the sea are diminishing by flowing into volcanoes, combining with red-hot metals and being decomposed. This will not account for the gradual rising of the coast of Denmark out of the sea, as some other coasts—such as New Jersey—are sinking in the same ratio.

W. P., of Ohio.—You are generous in your offer of 5 per cent for our services, if we can sell your meteorite, of 103 lbs., to some European agent for its weight in gold. We respectfully decline; as business of this character is not in our line. The "solid men of Boston"—the members of its Society of Natural Sciences, who recently petitioned the authorities at Washington to have a meteorite brought all the way from the Rocky Mountains—may assist you to a favorable transaction.

G. S. A., of Pa.—We do not know of any wooden covering having been used for hay-cocks in the field; cloth is very often used. Any one would have a right to make wooden caps for the purpose.

O. M. B., of Mass.—The best mixture known to us for preserving the standard cast iron weights to which you refer from rusting, is by applying to them hot linseed oil containing a very minute quantity of beeswax; then allow them to dry perfectly before they are used.

N. A., of Kansas.—The philosophy of kyanizing timber is to apply a solution—such as the sulphate of copper—which will unite with the albumen of the wood and form an insoluble compound, and a poisonous one also, to insects and vegetable fungi, which are liable to attack and destroy the wood.

W. W. S., of Conn.—Cohesive attraction cannot be said to be greater in hard than soft steel, or vice versa. It simply means the tenacity which atoms exhibit in adhering together. The breaking weight of iron and steel is the co-efficient of their cohesive force, when this term is employed in a mechanical sense.

P. H., of N. Y.—A telegraph office in a building does not increase the danger from lightning. You can easily convey the current which comes on the wires into the ground. Put up a ¾-inch thick iron or a ½-inch copper rod on your building; allow it to project 10 feet above the chimney; connect all the parts perfectly, and carry it into the ground for about 10 feet, and you will have a good conductor.

MONEY. RECEIVED

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, July 14, 1860:—

S. A. Co., of N. Y., $250; S. B., of Ohio, $25; D. R., of N. Y., $25; A. S. B., of Iowa, $106; C. F., Jr., of Ohio, $30; R. M. L., of Minn., $18; M. G. W., of Ill., $40; E. T., of Maine, $30; J. W. K., of N. Y., $30; J. Y., of Pa., $55; D. L., of Pa., $30; C. & M., of N. Y., $30; T. T. S., of Pa., $60; T. W. McD., of Ill., $25; E. S. B., of N. Y., $25; J. H. B., of N. Y., $30; W. C., of N. Y., $60; W. G. M., of Va., $25; H. H. E., of Ill., $15; C. H. L., of R. I., $25; O. M. M., of N. Y., $30; F. W., of N. Y., $25; A. S., of N. Y., $25; J. M. S., of N. Y., $25; R. M. G., of N. Y., $25; S. B., Jr., of N. J., $55; S. L., of Ohio, $30; J. A., of Ill., $25; H. N. B., of N. Y., $35; W. H., of Ill., $25; J. K., of Mass., $55; W. C. W., of Ill., $30; A. A., of Conn., $30; H. R., of N. Y., $30; H. F. W., of Pa., $25; C. L. A., of N. Y., $30; J. H. B., of Iowa, $25; E. H., of Maine, $30; P. F., of Miss., $25; T. S., of Pa., $30; J. G. R., of Maine, $25; B. S. P., of Conn., $20; J. E. T., of La., $30; M. C. B., of Mo., $10; R. H., of Conn., $25; C. & N., of Oregon, $100; M. F. J., of Tenn., $25; D. S. H., of N. Y., $25; J. K., of N. Y., $35; O. F. B., of N. Y., $25; J. H. W., of N. Y., $25; J. O., of Conn., $25; N. J., of N. Y., $25; M. K. P., of N. Y., $28; F. M. G., of Ga., $55; C. H. B., of Mass., $25; G. W. R., of N. Y., $55; H. H. H., of Pa., $25; G. B. M., of Mich., $30; W. V. G., of Conn., $30; J. D. T., of Mass., $30; E. G. B., of Mich., $25; P. L., of N. Y., $30, J. L. B., of Ohio, $15; P. N. B., of N. Y., $50; W. E. F., of Mass., $30; P. & R., of Mo., $55; G. W. Van D., of N. Y., $25; H. & H., of Ind., $10; J. J., of Vt., $35; F. E. M., of N. Y.; $30; O. & H., of Ill., $25; C. A. D., of Cal., $25; W. L., of Pa., $30.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, July 14, 1860:—

D. S. H., of N. Y.: S. B., of Ohio; C. H. B., of Mass.; L. A. F. DeC., of France; D. R., of N. Y; P. F., of Miss.; E. S. B., of N. Y.; A. S. B., of Iowa (2 cases); M. K. P., of N. Y.; M. & R., of Va.; T. C. H., of Ga.; C. H. L., of R. I.; F. W., of N. Y.; J. A., of Ill.; A. S., of N. Y.; J. M. S., of N. Y.; W. H., of Ill.; G. W. Van D., of N. Y.; T. W. McD., of Ill.; McC. & B., of Mo.; B. S. P., of N. Y.; T. M., of Conn.; O. & W., of Ill.; M. F. J., of Tenn.; H. N. B., of N. Y.; J. K., of N. Y.; O. F. B., of N.Y.; H. Y. W., of N. Y.; H. H. H., of Pa.; J. H. B., of Iowa; J. O., of Conn.; R. M. G., of N. Y.; N. J., of N. Y.; E. G. B., of Mich.; S. B., Jr., of N. J., R. H., of Conn.; H. H. E., of Ill.; J. H. W., of N. Y.

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THIRTY CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement sent for publication.

IMPORTANT TO INVENTORS.

THE GREAT AMERICAN AND FOREIGN PATENT AGENCY.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, are happy to announce the engagement of HON. CHARLES MASON, formerly Commissioner of Patents, as associate counsel with them in the prosecution of their extensive patent business. This connection renders their facilities still more ample than they have ever previously been for procuring Letters Patent, and attending to the various other departments of business pertaining to patents, such as Extensions, Appeals before the United States Court, Interferences, Opinions relative to Infringements, &c., &c. The long experience Messrs. MUNN & Co. have had in preparing Specifications and Drawings, extending over a period of fifteen years, has rendered them perfectly conversant with the mode of doing business at the United States Patent Office, and with the greater part of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK ROW, NEW YORK. We have also established a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND SEVENTH-STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at their office.

They are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business they have Offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris, and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

A pamphlet of information concerning the proper course to be pursued in obtaining patents through their Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the Principal Office or either of the Branches. They also furnish a Circular of Information about Foreign Patents.

The annexed letters, from the last three Commissioners of Patents, we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you have discharged your duties of Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability and uncompromising fidelity in performing your professional engagements. Very respectfully,

Your obedient servant, J. HOLT.

Messrs. MUNN & Co.:—Gentlemen: It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency, and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully,

Your obedient servant, WM. D. BISHOP.

Communications and remittances should be addressed to

MUNN & CO.

Publishers, No. 37 Park-row, New York.

STEVENSON'S JONVAL TURBINE WATER Wheel, which gave a useful effect of .9077 per cent of the power employed at the late trial of Water Wheels at the Fairmount Works, Philadelphia, March 9, 1860, are manufactured by J. E. Stevenson, Novelty Iron-works, New York.

3 1* J. E. STEVENSON.

$3 A DAY.—AGENTS WANTED FOR THE MAMMOTH FAMILY PICTORIAL, published by MARIE LOUISE HANKINS & CO., No. 132 Nassau-street, New York City. Only 75 cents a year. Enclose six cents for a specimen copy. 1*

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A MESSIEURS LES INVENTEURS—AVIS IMportant.—Les inventeurs non familiers avec la langue Anglaise, et qui prefereraient nous communiquer leurs inventions en Francais, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront reçues en confidence.
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A PATENT SAD-IRON HEATER.

The invention illustrated by the accompanying figures consists of a novel appliance to be attached to an ordinary fire-grate for the purpose of holding sad-irons while heating those impressing agents which afford mankind the enjoyment of unwrinkled linen.

Fig. 1

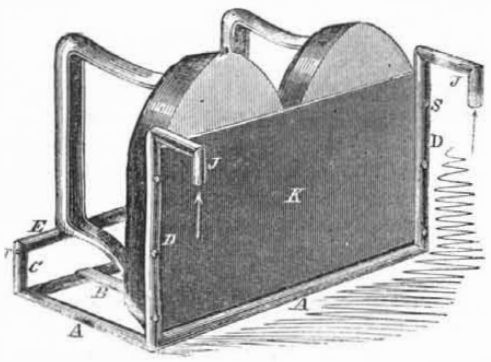
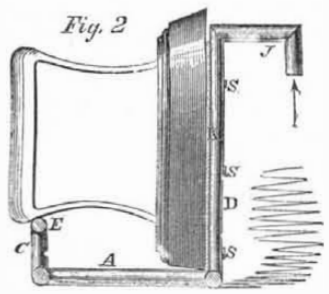


Fig. 2



A rack is constructed of hollow metal tubes of suitable strength and capacity, which are arranged in such a manner as to be hung to the top bar of an ordinary grate. Hot air is conducted through them from the fire, and heat is thus given out to the irons on the rack independently of the direct heat which they receive from the fire. A guard-plate is also provided for the rack to protect the irons from being burned or smoked. The metal tubes, A, forming the heating rack, are joined by metal slats, B, as shown in Fig. 1, which is supposed to be hung on the fire-grate, with two irons in it. C C and D D are the perpendicular tubes. E is a back longitudinal tube, on which the handles of the irons rest. All these tubes are connected together and with the catch tubes, J J, which hang upon the grate-bar. The mouths of tubes, J J, project down into the fire. K is a sheet of iron which passes crosswise from the two tubes, D D. It protects the bottoms of the irons from the flame and smoke, so that they are always maintained in a clean state, ready for use.

By the common method of heating sad-irons they frequently get dirty and smoky, and they thus require constant scouring; if this is forgoten to be performed, the clean linen is soiled and must be washed over again. This guard-plate is therefore a very useful contrivance. The hot air is conducted through the tubes, as shown by arrows, the sheet metal guard being attached by pins, S, passing through tubes, D D. No further description is necessary; the merits of this sad-iron heater will be at once appreciated by all good housewives and laundresses.

This contrivance is the subject of a patent, dated June 5, 1860, issued to W. J. Andrews, of Columbia, Tenn., whom persons desiring further information may address.

"THE AMERICAN PUMP."

This famous hydraulic engine (the invention of an ingenious mechanician, John Powers, of this city) was patented on April 5, 1859, and illustrated and described on page 296, Vol. XIV (old series), SCIENTIFIC AMERICAN. Since that period, however, the popularity of this water elevator has continued to increase, and the testimonials in its favor can now be counted by thousands; the latest of these is that of the reporter of the New York *Express*, who recently witnessed a practical exhibition of the *powers* of this pump, and who states as follows:—

"About a year since, after an examination of the above invention, we gave a favorable notice of it, since which ample time has been afforded to test its real merits, which we learn has been successfully done in almost every section of the Union. At the residence erected immediately upon the site of old Fort Independence, in South Yonkers (owned and occupied by W. O. Giles, Esq., of the house of Andrews, Giles, Sanford & Co., 100 Chambers-street), one of these pumps has lately been put in operation. It is set in a reservoir. We visited the above locality for the purpose of witnessing the operation of this pump. While present, Mr. Edney and Mr. Giles measured the distance from the spring to the house, which was found to be 862 feet, and the perpendicular elevation was 158 feet. They then put the pump in operation, and through a ¾-inch pipe (which was very much against the pump, being too small) they forced over 5 gallons of water per minute to the above distance and hight. We have no hesitation in pronouncing it one of the most ingenious inventions in the way of hydraulics ever constructed. Those who have experienced a difficulty in getting water up into high buildings or to great elevations, at a trifling expense, will find in the 'American Pump' all they need combined, for it discharges at any number of given points, and throws water by hose from 30 to 60 feet by hand, with great ease and regularity."

We will only add that this excellent pump can be rigged so as to be driven, with great regularity and economy in many localities, by the improved windmill illustrated and described in another column of the present number, and that both these machines are manufactured and sold by James M. Edney, 147 Chambers-street, this city.

PATENT VALVE COCK.

Every improvement, however slight, in cocks for admitting and cutting off the flow of steam, gases or fluids through passages in pipes, is of great consequence, so great is the number used and so universally are they employed. A valve cock is useless unless it fits perfectly in its seat, so as to prevent leakage, and if not ground as to fit snugly, it is very troublesome. The accompanying illustration represents an improved construction of valve cock, which affords superior facility for grinding, which is often necessary to keep them in proper order, especially in the use of steam. The annexed description will explain the invention.

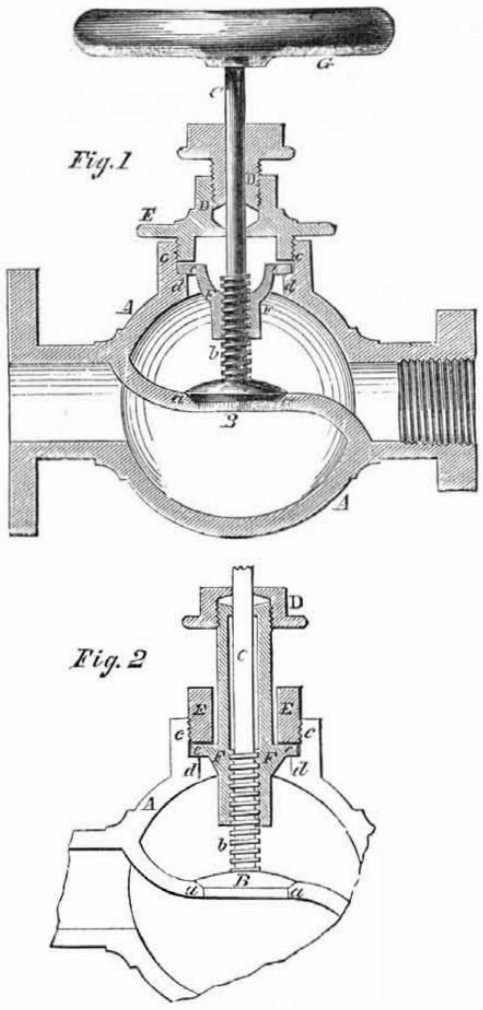


Fig. 1 is a full vertical section of the cock, and Fig. 2 is also a section similar in most all respects to Fig. 1, but the nut, F, is extended through cap, E, with the stuffing gland, D, fitted to it, which is a preferable arrangement in some cases. A represents the shell of the cock, having the valve seat, *a a*, constructed and arranged in the usual manner. B is the valve, having the screw thread, *b*, on the lower part of its stem, C, and having its upper part fitted to a stuffing box, D, in the movable cap, E, which screws into a socket, *c c*, in the upper part of the shell, A. F is the nut in which the screw thread, *b*, on the valve stem works to open and close the valve. This nut is made with a flanch, *e e*, which rests upon a shoulder, *d d*, formed round the lower part of the socket, *c c*, and which is held down upon the said shoulder by the cap, E, being screwed down closely upon it. The lower face of the said flanch is ground to the shoulder, *d d*, so that it constitutes a packing to the cap, E, and protects its screw from the steam and water, and the exterior periphery of the said flanch fits snugly but easily into the portion of the socket, *c c*, below its female screw thread into which the male screw of the cap, E, is fitted. The external portion of the nut below the flanch, *e e*, may also be fitted snugly but easily into the lower part of the socket below the shoulder. *d d*. When the cap, E is screwed down tightly upon the flanch, *e e*, of the nut, F, and the said nut thereby prevented from turning, the turning of the valve stem by the hand wheel, G, opens or closes the valve by the movement of the screw thread, *b*, in the nut; but by increasing the cap, E, to the extent of a mere fractional portion of a revolution to liberate the flange, *e e*, from its pressure, the nut is left free to turn along with the valve stem, and the valve free to revolve in its seat for the purpose of grinding, and in the grinding operation the flanch, *e e*, of the nut, E, keeps the valve stem perpendicular to the seat or parallel with the axis thereof, and causes the valve to be ground perfectly true; and by unscrewing the cap, E, entirely out of the socket, *c c*, the valve and nut are permitted to be withdrawn together from the shell. The facility thus afforded for grinding the valve, it will be at once seen, is very great; as no wrench or screw-driver is required to be applied, unless it be to the cap, E, and thus, if the flanch, *e e*, be properly fitted to its seat on the shoulder, *d d*, it may be turned by hand. Besides this advantage, the cock consists of few parts and is of very simple construction.

A patent was granted for this improvement on the 12th of June last, to Messrs. R. Nickerson and A. B. Colton, of Athens, Ga., from whom more information may be obtained by letter.

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